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VOL. XX. NO. II

LOS ANGELES, CAL.

March 1, 1899.

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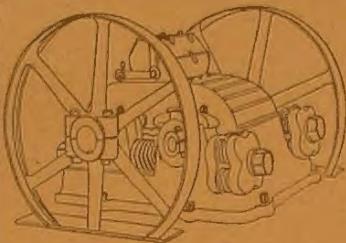
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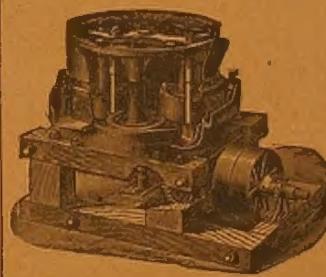
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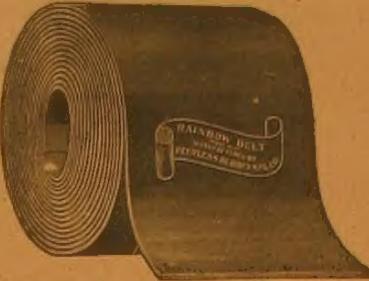
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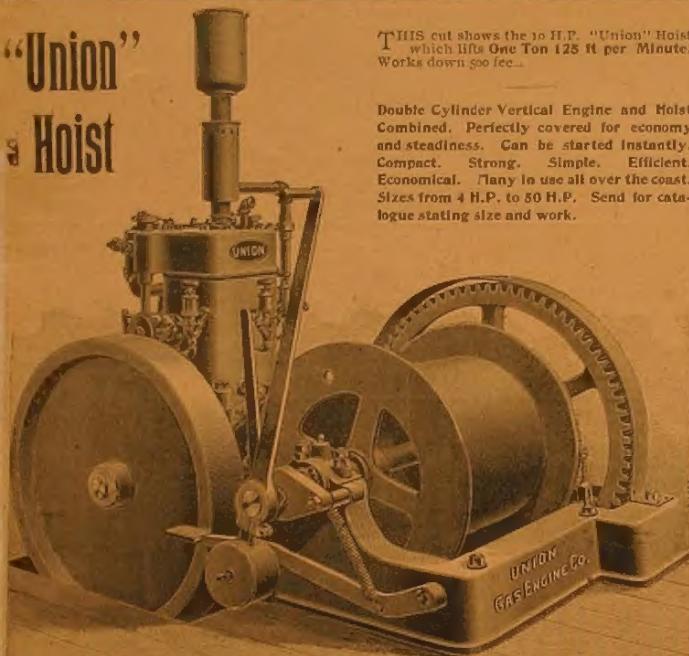
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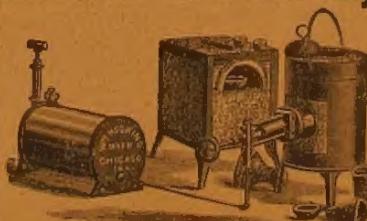
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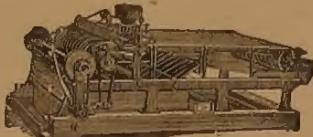
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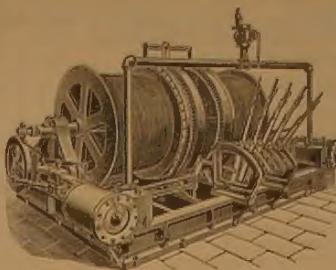
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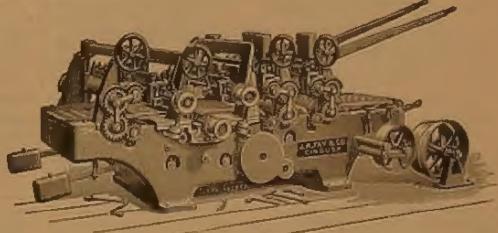
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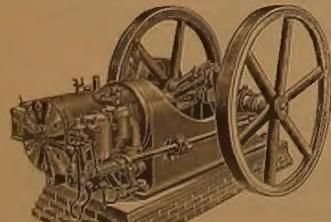
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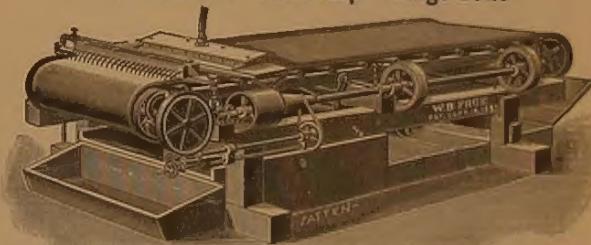
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## THE FINANCIAL SITUATION IN TWO ASPECTS.

The first and most serious aspect is that relating to the national expenditures and revenues. The tax laws external and internal are very searching. The imported articles in the free schedule are fewer than they have ever been, except during the civil war, and, consequently, the dutiable schedules are more comprehensive. The duties also range higher than in any tariff ever enacted by Congress, except in the Act of 1841, and the laws enacted from 1861 to 1870.

Another feature affecting the customs revenue is the fact that importations have materially fallen off from two causes, one being the increase of duties on imports, which necessarily diminishes consumption of foreign commodities, as they increase their cost, and the other being the diversification and enlargement of domestic industries, through natural and inevitable growth, and by giving control of our own markets, through high duties, to our own manufacturers.

Internal taxes are nearly as sweeping as during the civil war, and, as the population is much larger and consumption greater, they yield as much revenue as the internal war taxes; yet with all this the revenues are considerably short of the expenditures, and, should the regular army be increased to 100,000 men, the deficit will be immense.

The present prospect is that to subject the Filipinos to our domination will entail an immense expense far in excess of the revenue that will be derived from the islands. The condition is such as to tax the genius of statesmen and financiers. This question is immensely more important than any revision of the monetary system, and especially on lines that will limit the money volume, so as to cripple the productive enterprises and trade of the country.

The balance of trade that has been in our

favor in international commerce for the last eighteen months has had an important influence upon the question of standard. Our gold resources have been materially increased, but not in a sum equal to trade balances, for the reason that some of our securities held in foreign countries have been paid off or purchased by our citizens. Whether the balances on our side will continue is problematical. Recent balances in the main have been caused by an unusual exportation of bread stuffs and provisions, on account of short production in several agricultural countries; yet it is a fact that we are beginning to export more manufactures than we import. This condition has increased the energy of the gold-standard men to revise the monetary system on their theory.

The Secretary of the Treasury and the Bankers' Alliance are pushing their scheme to retire the greenbacks, and substitute national bank notes, and finally the silver certificates and all silver money, except subsidiary coins, and to place the circulating medium wholly on the gold basis. If accomplished, this would leave gold coins the only legal tender money, for bank notes cannot be made legal tender, as they are obligations of private parties and not of the government.

Of course these propositions will be stubbornly fought by those who favor the double standard, and believe in government instead of bank currency. Nothing on the money question can be done in the present Congress for want of time and hesitation of the administrative party to take hold of the subject which will cause political agitation and probable disturbance to business.

Mr. Gage and his backers, however, will press their schemes upon the next Congress. It being republican in both branches, they hope to be successful.

### RECORDING MINING PLANS.

As the mineral resources of any country are an asset of the State to which it is not possible that anything can be added in future years, as in the increase of flocks and herds and horticultural products, it is the duty of our State Governments to see that the industry of mining is conducted in an economical and safe manner. The investment of large amounts of foreign capital in our mines makes it necessary that due regard should be paid to the manner of operating mines, so that the country cannot be robbed of its future mineral wealth by careless and improvident ways of working.

Deep mining can only be practiced where the upper workings have been left safe with that end in view. The object of the management of a mine may be solely to make large returns and a good revenue, especially when operated under a lease, with no regard for future operations, to a great depth. The owner of a mineral deposit is at most but life-rented in it, hence the necessity for a due regard for the rights and safety of those who are to follow mining in future years. If it has been the misfortune of the reader to open an abandoned mine, without having a plan of the same, or without any knowledge of the former workings of the mine, then he can appreciate the danger and the difficulty of such work. It is, therefore, of the greatest importance that annual progress in mines should be plotted on the underground plans and sections of the mine, and copies or tracings of the same deposited yearly in the State Mining Bureau, and also with the County Recorder. In the event of the destruction of

one by fire, the other will be available for future reference. In the western mining states, a prominent neglect is the absence of supervision which is shown for the future welfare of the industry in this respect; but with the increasing amount of outside capital which is being invested, the necessity of supervision and inspection, with the recording of mining developments underground becomes a greater necessity. In this matter the owners of adjoining claims have a special interest, for it is not the custom of all mine owners and managers to admit every one who may be interested to inspect or view the underground workings.

It is often claimed that we live in the land of liberty and enjoy excessive freedom, but the recording of annual progress in mines would in some cases prevent the liberty of making free with the minerals which by right belong to an adjoining claim, when such came under the eye of an inspector of mines or the injured owner. It would tend to prevent disputes and dishonesty, and make the work of the mining engineer and those under him less dangerous who undertake to open an abandoned mine. When it is necessary to record the surface plans and show the holdings of surface owners, it is equally as necessary for the future of the industry to keep a record of work in mining underground, which cannot be known when those who did that work have left the district.

## THE MINERS' ASSOCIATION OF SOUTHERN CALIFORNIA.

One of the most important movements attempted in the south for the benefit of the miners is the establishment of the Southern California branch of the California Miners' Association.

In order to keep up the splendid work mapped out by the Association, it is necessary that the whole State should join hands and pull together. Southern California, with its young but rapidly-developing mining industry, should have its representatives present at the next annual convention of the California Miners' Association, which meets at a date between the second Monday in October and the third Monday in November, to be fixed by the Executive Committee.

Among the movements inaugurated by the California Miner's Association, which will place the mining industry in a more important and prominent position than it has heretofore occupied before the National Government, and which is already bearing fruit, is the section of the Census Bill, passed by the House, February 6th, providing for the taking of a complete census of the gold-mining industry. This is a step in the right direction, and will lead to the making a division of Mines and Mining, under the Department of the Interior, which has been vigorously advocated by the California Miners' Association.

Attend the preliminary meeting of the Southern California Branch, to be held about the 10th or 12th instant, in the hall, corner First and Main streets, over the Orpheum Theatre. The date will be given out in the daily papers later.

### INSPECTOR OF MINES AND MILLS.

As recommended in former issues of this JOURNAL of recent date, a bill providing for an inspector of mines and mills has been introduced into the State Legislature at Sacra-

mento by Mr. Curtin, on the 8th of February. This wise action, although coming late in the history of mining in California, is a step in the right direction. The careful selection and appointment of a thoroughly competent mining engineer, or mine manager of long and varied experience, is necessary, to make the services of such an official a success and a lasting benefit to one of the State's chief industries. The position carries with it great responsibilities, and, under efficient and faithful discharge of duties pertaining to such an office, can be made of inestimable value in protecting against waste and loss of ore, of the State's future means of wealth, in enforcing proper mining methods, so as to render deep mining both safe to life employed in our mines, and profitable to capital invested therein. As a protection to the miners of this State, inspection and the enforcement of rules and laws for the safety of employees, requires the appointment of an experienced miner who possesses the determination to do his duty and do right, regardless of politics and personal consideration for those who violate the rules and laws. Such an official, free from the fear of political decapitation in the just discharge of his duties, can alone fill the position, and in many instances give advice and aid to the managers and foremen of mines, in their underground operations and manner of working, as well as in the control and handling of employees. Hence the urgent necessity for an inspector who is not appointed for his political qualifications.

**NOTE.**—It has since been ascertained that the precious lot of legislators, we were so unfortunate as to have represent the people, have knocked the measure in the head.

#### Railway Building in Mining Camps.

The conservatism which usually controls the building of railway lines cannot be safely consulted in reaching the mining districts. This was illustrated six or seven years ago in the incipiency of the Creede boom, when the demand for an extension of the Rio Grande from Del Norte to Creede was very urgent. Owing to a fear that the output of the mines would not prove permanent, the company refused to build. D. H. Moffat and associates decided to build the line themselves, as they knew that the traffic might be expected, even if comparatively temporary, to pay a handsome interest on the investment. The great rush to Creede gave a phenomenal passenger traffic, and this in turn, aside from the mineral output, which was already great, created a heavy freight movement. The result was that in a few months the Rio Grande was only too glad to buy the line.

The building of the Florence & Cripple Creek railway from Florence to Cripple Creek a year or so latter is another example of brilliant foresight and nerve. Mr. W. E. Johnson seeing the great advantages to be secured by a railway line to the great gold camp, endeavored to enlist Canyon City in the scheme, as that was a wealthy place and apparently the natural point from which to establish communication. In fact, the sleepy slow-going Canyon City people were so imbued with the importance of the natural advantages they possessed that they turned a deaf ear to Mr. Johnson's representations and appeals for aid. When he then dropped down the river to Florence, fifteen miles, they ridiculed him and said the line would never be built, or if built could not be made to pay. The Canyon City people had enjoyed the advantage of a branch line of road to Silver Cliff, that, having been washed out

by floods three times, was finally abandoned after a struggle of several years to maintain it. After the Florence & Cripple Creek road had been fairly started and its ultimate success fully assured, a great milling and smelting interest was developed at Florence. In so marked a way has this feature been developed that already the ambitious young city essays to contest the title of "Smelter City" with Pueblo.

Mr. Johnson, having enlisted abundant capital to carry the scheme to a successful conclusion, retired from the active management of the Florence & Cripple Creek and organized the Florence and Southern Railway, a line projected to run from Florence to Silver Cliff. The panic and the numerous incidentally depressing sequelæ occurring, have prevented any aggressive measures towards the consummation of the project. Now, however, with the resumption of work on the Bassick and a general revival of mining in the Silver Cliff district, it may be expected that the Southern Florence will become a factor in the new Custer county boom.—*Ores and Metals.*

#### CORRESPONDENCE

##### CANADA.

###### Sharbot Lake District.

The district which is attracting the most attention at the present time is the Sharbot Lake District, between Toronto and Montreal, north of the Canadian Pacific in Clarendon township. The Boerth Mining Co., of Detroit, Michigan, are opening a series of veins near Ardoch, in this district, and for the work accomplished they show some of the finest ore that can be found anywhere. Their veins run from one foot to eight feet wide, and their ore piles average from \$10 to \$40 from average tests made by crushing in a mill. Their shaft is down 52 feet, where they have a two foot vein which averages \$54, and the next five feet of broken country rock and stringers of quartz averages \$24. This, however, has not been corroborated as yet by deeper work in regard to the foot wall stringers, but selected pieces of the ore have continually assayed from \$50 to \$180, although they contain only 3 per cent sulphuretes and scarcely any visible gold. The sulphuretes are remarkably rich, and are for the most part iron pyrites with some little mis-pickel. The ore also shows from traces of bismuth up to a considerable percentage in certain parts of the belt, and all ore showing bismuth carries a good percentage of gold.

This company, unfortunately, has been caught by the process man, and they are building a small mill of doubtful utility, but it can easily be converted into some simple mill to be used for testing in the course of the development.

The property was recently examined by Wm. M. Courtis, the mining engineer of Detroit, Mich., who recommended considerable development on the property, and a trial run with the present mill to prove its ability to save the gold.

In the immediate neighborhood are other large veins showing very fine surface quartz with considerable Bismuth. Only small pits have been sunk on these veins, hardly sufficient to test their width and permanency, but for the work done they make an excellent showing of the species of ribbon-rock in some parts of which free gold may be discovered.

The Boerth Mining Co. has obtained suffi-

cient capital to finish the surface work and to sink three shafts, which are now going down. They are proposing to raise a large amount of capital to thoroughly develop their mine and build such a mill as they require, according to developments made. Their chances for success are remarkably good. The appearance of their ore is such that most experts would pronounce it of low-grade, but it not only shows well in free gold on panning, but also the sulphuretes run high when all free gold has been amalgamated out.

The property to the north of the Boerth mine is also being developed in a small way, and the ore as opened indicates a very promising location. It is expected that in the spring, with the disappearance of the snow, this district will commence active operations.

#### NEVADA.

SILVER PEAK, NEV., Feb. 17, '99.

**EDITOR JOURNAL:**—This town is very dull at present, but we expect S. R. Masson to be back soon from Carson, in company with C. Canda and Young Blair, of New York, and no doubt we will soon be in a boom again.

The big 70-foot ledge at the Drinkwater mine will not lie idle very long, as the whole ledge averages about \$15.00 per ton in gold. Before the striking of the big ledge, the mine was offered for sale for \$500,000, but after they found this ledge, the company raised the price to \$1,000,000, and if a buyer is not found willing to pay the price the company asks for the mine, they will work it themselves.

About five or six miles south of here are the Sand Hills, which are known to contain gold, ranging from 50 cents to \$2.25 per ton, and there are millions of tons of it. Some day, I believe, every ton of it will be worked at a profit.

A month or so ago, Ed. Drennis with another fellow came here from Arizona. He was sent by a party of experts and mining men, he said, from Arizona, to get some of the sand and bring to them, but we have never heard anything since from him. The hills are open to location to anybody, as it takes capital to work them, and poor men have not got it.

Last week, L. E. Chiatovich went to his mines with Joe Prout and E. Dykes. A contract was let to Joe Prout to run a tunnel at the Battle Snake mine until he strikes the ledge. Prout said he thinks he will strike it between 150 and 200 feet, and it will not take very long to run that distance as the rock is very soft.

There is talk that Henry Jagels will put up a 5-stamp mill himself. Sam Case has found some paying rock at last, and he has some of the \$10 and \$5 rock piled on the dump. He expects it will be worth something when the Blair's company starts the mill. There are quite a lot of prospects on the hills that go from \$10 to \$15 per ton in gold, but they don't pay at present. Of course, if the owners had money to erect a little stamp mill all of them would be worked profitably, as the wood and water could be had very cheaply.

This district is becoming well known, and attracting considerable capital from New York and other large and wealthy cities in the east, so we look forward to a prosperous year to follow the next twelve months. The outlook is brilliant and we are hopeful of better times.

**MASSACHUSETTS.**

BOSTON, MASS., Feb. 23rd, 1899.

The sensation of the week was furnished by Calumet & Hecla. The directors of this company declared a dividend of \$40 per share; \$10 regular and \$30 extra. This is the 110th dividend declared by the company and makes a total disbursement of \$59,850,000. Today's dividend is the fourth of the fiscal year, beginning May 1 and makes \$70 thus far declared as against \$46 last year.

The copper market has been active and higher, and transactions on the Boston Exchange for Monday, February 20th, were greater than on any day for several weeks. \$1000 per share is freely predicted for Calumet & Hecla, and some well informed people talk \$1200, for this king of copper stocks. There has been much talk of a reaction in copper speculation but the demand for good mining stocks seems to be on the increase, and people who have not speculated for years are coming into the market.

The much talked of consolidation of well-known mining companies by the Standard Oil people seems to be nearing a consummation, and this has stiffened the price of the stocks which are supposed to be involved. We look to see a strong copper market for some time to come. The low priced copper stocks offer the best inducements for those speculatively inclined and several new properties are soon to be brought out in Boston.

The outside market was firm with Santa Fe perhaps the most active, with sales at 23 $\frac{1}{4}$ . Copper Range sold at 55 and is offered at this price.

Bingham sold at 16 $\frac{1}{4}$ ; Victoria 11 $\frac{1}{4}$ ; Michigan 18 $\frac{1}{4}$  @ 19 $\frac{1}{2}$ ; Miner sales at 44 and 45; Wyandot 9 $\frac{1}{2}$  @ 10; Trimountain 16 $\frac{1}{2}$  @ 17.

Yours Truly,

ROBERT S. BICKFORD,  
60 State St., Boston, Mass.

**MEXICO.**

**La California Camp, Moctezuma District, Head Waters, Yaqui River.**

SONORA, MEXICO, Feb. 15, '99.

Our camps, after being quiet for several months, is on quite a boom, which may soon grow into one of the greatest that we ever had in Mexico. New rich strikes are being made in all directions near our camp; within one mile from headquarters, half a dozen rich strikes are being located in the last few days; one new location, ledge 10 feet wide, assays from \$10 to \$500 in gold. A piece of ore from the ledge, as large as a man's head, shows coarse free gold all over it, would assay into the thousands. This ledge was located by the prospector the first day he prospected. The next day another prospector found and located another large ledge of sugar quartz with free gold in it. One of the oldest mining companies in the district has located two ledges near camps, both are rich in gold and silver. An extension of one of our claims was located a few months ago. The ledge is from 15 to 50 feet wide. Where it is 15 feet wide, it shows an average assay of \$103 in gold.

Mitchell, Clark, Evans, and Stant, are pioneers of the camp and own La California and Pasadena, on which they have done considerable development work, besides owning other claims which promise equally well. La California is said by many to be the bonanza of the camp, showing average assays across the ledge from \$30 to \$50 per ton where the ledge is 20 feet wide. It is 60 feet wide in

places. Many assays have been made from this ledge, showing from \$50 to \$200 per ton gold and \$15 to \$30 in silver.

In No. 1 tunnel in the California cross-cutting, the ledge at 125 feet below the surface assayed from the face of the ledge, 18 feet wide, averaged \$76 in gold.

Mexicans located two claims a few days ago and commenced shaft on each ledge. Assays from shaft only a few feet deep, ledge 5 feet wide, gave \$200 in gold and 195 ounces in silver. Half pound of ore from the other shaft showed fine gold all over each piece of ore, and would assay several thousand dollars to the ton, and is the richest ore yet found in the district. Two Mexican prospectors brought in samples from two new ledges to be assayed—one from a ledge 15 feet wide, showing in the horn spoon considerable gold, the other ledge was leased and could not be tested with the spoon.

Prospectors with their outfits are coming in camps every day, the hills are alive with them. Where everything was quiet in this vicinity a month ago, today blasting can be heard in all directions. All indications are favorable for a rapid growth and a rich camp here. Wood and water are generally plentiful. The writer believes the camp will prove to be the richest gold-producing camp in Mexico in a few years; thinks it a much safer proposition for capital than Alaska. A railroad has been surveyed from Bisbee, Arizona, to the large copper mines below our camp, and graded under the Arizona tax exemption law to the line of Mexico to be continued to their property, which will give railroad facilities within 12 or 15 miles of this new camp. These are facts which a visit to our camp will fully establish.

C. W. MITCHELL.

**UTAH.**

SALT LAKE CITY, UTAH, Feb. 17, 1899.

**EDITOR JOURNAL:**—The Utah mining share market this week was fairly active, but with a few rare exceptions stock steadily declined. I expect this liquidating period to continue for a week longer and then to see a re-action take place which will carry stocks to a higher point than has yet been reached.

Immediately after the annual election and announcement of the new board of directors, which contained some notable names in mining affairs, Ajax stock made a strong advance and has held it. Alliance continues about the same. Anchor advanced a trifle in the bidding. Bullion-Beck paid a dividend of 10 cents per share—or \$10,000—on the 15th. The stock was higher and in better demand in consequence. Buckeye was stationary. Centennial Eureka paid its regular dividend of \$15,000, on the 15th. The shares hang steadily around \$40.00. Chloride Point was freely offered at the close. Apparently inside support has been withdrawn for the moment. I have every reason to believe, however, that the shares will advance later. Daly was off a trifle. The annual meeting will be held on the 20th. This week the papers in the matter of consolidation of the Daly-West concerns were filed for record, and all matter of the connection with the welding together of all conflicting interests will be completed at the annual meeting which takes place on the 20th. The mine will start up on March 1st, and shipments commence forthwith. It is possible that considerable stock may appear after the consolidation and a temporary decline occur; but prices will finally adjust themselves, and I look for very much higher quotations.

Dalton and Lark recovered from its rapid

decline, and at the close was strong around 12 $\frac{1}{2}$  cents. Dalton was a heavy seller around 3 cents. I understand that the company has some very high grade gold ore sacked for shipment, and which will be sent in as soon as the roads are open. Dexter was on the downward grade. Daisy hangs steadily around 50 cents. Eagle of Mercur was inactive. There was an unconfirmed report of a strike of high grade silver and gold ore in the Eagle & Blue Bell, but the stock was stationary. Four Aces continues active with but little change in prices. The knowing ones predict that the stock will touch 75 cents, but I doubt it. Geyser-Marion was steady, but not particularly active. The cyanide shipments now coming in are very satisfactory. Galena reported the uncovering of a fine quality of ore, but the shares were lower. Grand Central did not move particularly. There is no further talk of litigation. The regular shipments being maintained and the quality of the ore is unchanged.

Horn Silver will hereafter ship considerable copper ore, which should increase the earnings of the company. The shares were a trifle stronger. Homestake was steady at 10 cents. Ingot was unchanged. The development work at the mine continues favorable. Joe Bowers was one of the most active stocks on the list. The pressure to sell was very great, but the offerings were readily absorbed. There is no change in the situation relative to the prospective litigation. Joe Bowers extension was very soft. This company is also threatened with a law suit, and I expect to see the shares go lower. Lower Mammoth was steady at last week's figures. The showing at the mine is really very fine. Little Pittsburg was higher. I expect to be able to report some very favorable news relative to this property shortly. Mammoth reported a strike of high grade ore and bounded up the first part of the week, but could not hold its quick advance in the face of free offerings and gradually receded. Mercur eased off. There does not seem to be any particular pressure to sell but the stock lacks support.

Northern Light was weak. The superintendent of the property reports the ore showing to be improved and that shipments of high grade ore will continue as soon as the roads are in condition to resume ore hauling. Omaha advanced rapidly and the high figures brought out considerable stock. Ontario was steady. Sunbeam was very strong. The syndicate now operating the Overland, it is said, have taken a bond on the Sunshine. The shares are very likely to advance. Swansea was steady around \$3.50. South Swansea was unchanged. Silver King was stationary. Star Consolidated was in fair demand, but declined slightly. Tetro was lower. Valeo also registered a decline. Utah was unchanged. West Mountain Placer's pumps are at work again and the stock was stronger.

**Albany Compound.**

Engineers having in charge the management of large plants will be interested in a letter which Adam Cook's Sons, 313 West Street, New York, manufacturers of the Albany Lubricating Compound, received from J. F. Wilson, chief engineer of the Equitable Building, New York. He says he has used the Albany grease for the past twenty years, and has also tried other greases on the market, but has found nothing that will equal the genuine Albany compound. He says it is all the manufacturers claim for it, and more too, and it is a pleasure to recommend such an article.

## Miscellaneous Mining News.

## ALASKA.

## Another Rich Strike.

The richest gold strike made for months is reported from McDonald Creek, Northwest Territory. The strike is close to the boundary line of British Columbia and the Northwest Territory. The creek drains a natural basin that slopes down toward Lake Marsh and the Upper Yukon. The creek is five miles long.

Surface gravel gave from \$1 to \$2 a pan. In the country adjacent to McDonald Creek, there are innumerable creeks not yet prospected. The gold is coarse and assays high.

## ARIZONA.

The offices of the county recorder and territorial secretary are being flooded with articles of incorporations of copper companies, mostly eastern organizations. This movement is due to the steady advance of copper without any signs of a recession. There were filed in the office of the county recorder articles of the Boston & Texas Copper Mining Company. The incorporators are Rodman M. Price, Joseph Reall and Waller E. Berrien of New York. The capital stock is \$2,500,000, the number of shares 1,000,000. Phoenix is to be the principal place of business, with branch offices at Wichita Falls and Archer, Tex., New York, Boston, Hartford, and other places in Europe and America. The other company is the Mayme-Garoo Copper Mining Company. The incorporators are Charles Waite, John T. Clark and George B. Deming. The capital stock is \$2,000,000, shares \$1 each.

## CALIFORNIA.

## AMADOR COUNTY.

D. Adams, his brother and another man have been prospecting and pocket-hunting on the doctor's ranch, near Ione, for some time. A few weeks ago they struck it rich and have taken out about \$7,000, and the pocket has not been emptied yet. This phenomenal find enthused many of the old-time pocket hunters and miners in and around Ione, and they are out on the hunt in many places.

The last report of the Oneida mine was that they were crosscutting to strike the ledge at the 1700-foot level. They struck the vein at 135 feet from the shaft, and are now engaged in drifting both north and south on the vein, each drift being in about sixty feet.—*Amador Ledger*.

## CALAVERAS COUNTY.

The mill in Angel's Camp, Calaveras Co., is dropping its full number of stamps. There is now enough water in the reservoirs to keep the mines running at full capacity until early fall. In all probability the mines of Angel's will not close down this year.

The new mill has been completed at the Thorpe gold mine, near Fourth Crossing. The thirty stamps are dropping day and night. About sixty men are on the pay roll. Superintendent W. L. Honnald reports the new concentrators satisfactory. The substantial backing of this enterprise gives it the advantage of having the public confidence.

## EL DORADO COUNTY.

J. C. Heald has commenced unwatering the old Montezuma at Nashville, preparatory

to commencing development work on an extensive scale.

The Independence mine at Slate Mountain is holding its own. Drifts have been run both north and south from the point of intersection, showing no material change in the grade of the ore, but proving beyond doubt that the ledge increases in width with depth—it being twenty-four inches in the bottom of the drifts. The ore is said to yield \$50 to the ton.

## FRESNO COUNTY.

The directors of the Placerville Gold Bug Mining Company of Fresno, Cal., have organized, with Dr. A. J. Pedlar as president; O. L. Everts, vice-president; M. W. Muller, secretary; C. A. Shattuck, assistant and the Bank of Central California treasurer. Reports submitted showed that a portion of the machinery recently purchased has been delivered and the remainder will be shortly. The work of sinking a double compartment shaft and the systematic development of the mine will be prosecuted.

## KERN COUNTY.

The Yellow Aster people are going to put up a number of small houses for their employees. They have now ordered the lumber for four, to cost about \$500 apiece. This is a good move, as there are few comfortable homes for rent here.

Horace Adams has taken a lease on the G. B. running for six months from December 1st last to June 1st of this year. He is taking out a good deal of ore, and last month milled 75 tons at the Red Dog mill in Johannesburg, which went \$12 a ton. The G. B. is a good low grade mine, and somebody will yet make a fortune out of it.

In the Boston mine, near the G. B. they have an 8-foot vein of ore. It is low grade, but it all horns something, and the nearness to the new mill at the Black Hawk mine will enable them to have it worked at a low cost. This property is owned, as is also the G. B., by McCormick, Powers and McComb. The shaft is only down about 40 feet, but the ore is there and getting better all the time.—*Randsburg Miner*.

## LOS ANGELES COUNTY.

The California Mining and Development Company shipped a lot of provisions and mining implements to Lancaster, to be transported to the newly-discovered mines in the Lockwood Valley region. The owners of these mines expect to reap a rich reward in the near future.—*Ex.*

## RIVERSIDE COUNTY.

## Deposit of Graphite.

A. Graham & Son, who are putting down the well for L. S. Mason at Willard, Riverside county, have gone through a stratum of sand rock, forty to fifty feet thick, highly impregnated with graphite. Tests of the substance have been made by experts in Los Angeles and San Francisco, and also by Prof. Hilgard, who pronounce it to be a find of rare occurrence and superior quality.

Sam Walker, of Menifee, has recently made a rich strike in a mine owned by him near Menifee. Rock has been taken from the mine which has assayed as high as \$200 a ton, and there is lots of rich ore in the ledge.

## SAN BERNARDINO COUNTY.

The supervisors of San Bernardino county are having a well sunk near the summit on

the road between Dale City mining district and Bagdad station on the Santa Fe Ry. It is now down 100 feet, and when water is found will aid the mining interests in that section and give better connection with the railway system, as it is located 23 miles south of Bagdad and 12 miles from Dale City, being a shorter distance than to the Southern Pacific.

The Slate Range Quartz Mining Company of San Bernardino filed three claims each for ten inches of water for mining in the Crown Prince mine.

A prospector, grub staked by Mart McKinney, J. B. Parazette and Geo. Ferguson, has just reported a discovery of rich mineral. It is located in the Holcomb Valley Mining District, near the Black Hawk Mine, and the ledge, which is 80 feet wide, assays 11 per cent lead and \$50 to the ton in gold. They have named it the Black Lead, and Messrs. McKinney, Parazette and Ferguson will leave San Bernardino in a few days with seven miners to run a shaft and open up the richest strike that has been made for years.

## SAN DIEGO COUNTY.

Reports from San Diego show an unusually large number of mining claims being recorded. The locations are chiefly in the Julian and Banner districts, and some in the Ogilby district.

In the Cargo Muchacho district, San Diego county, E. Valdez made a strike near the Cargo Muchacho mine of a ledge two feet in width, and the ore runs \$27.70 in gold per ton.

## TUOLUMNE COUNTY.

The Excelsior shaft is down 180 feet. Progress is necessarily slow, as the sinking is being done by hand drilling, while the rock is so extremely hard that not over four feet can be made per week of twenty-one shifts.

The Turner Flat gravel mine is reported as showing up richer than ever under the new management. A full force is employed.

Driving ahead of the tunnel on the North Star will be resumed as soon as the present work of cross-cutting and sinking holes at intervals of fifty feet along the vein from the surface is completed.—*Sonora Union-Democrat*.

## COLORADO.

## The Evening Star Leased.

The Evening Star mine, located on Sawmill Hill, in Ward, and owned by H. J. Zieman, has been leased and bonded to the Wentworth Gold Mining and Milling Company. The negotiations for the company were made by General Manager H. F. Sutton of Sunset, and the other parties to the transaction were Messrs. Vastine and Dunlap, who had a lease and bond on the property from the owner. The lease runs to December, 1900, and the amount of the bond is \$3,000. The Wentworth Company has for a long time been trying to secure the Evening Star, as the claim runs into the group owned by the company. It is pronounced by experts one of the best properties on the hill, Mr. Zieman having taken out a shoot of ore averaging better than \$200 in gold per ton. There are several surface openings on the mine, all of which show ore. A crosscut tunnel has been driven in 200 feet, at which distance the vein was struck. A contract was let by Mr. Sutton for driving the tunnel 100 feet further along the vein. The Wentworth crosscut tunnel will open the Evening

Star vein at a depth of 400 feet. Mr. Sutton leaves for the east this week, to make further arrangements with the company for rapidly prosecuting development work.

The strike made last week in the bottom drift of the Los Angeles on Battle Mountain, Cripple Creek district, is showing better than ever. The lead is now about  $3\frac{1}{2}$  feet wide with a streak from one-quarter to one inch of rich sylvanite. The whole is good for five ounces to the ton. Lesser Searle is now saving ore for the initial shipment. There seems no doubt that the find is a continuation of the Modoc shoot. The vein is described as being well defined between granite walls."

Recapitulation of ore production from the Portland mine at Cripple Creek from April 1, 1894, to December 31, 1894:

	Net Tons	Gross Value
April 1 to Dec. 31, 1894.....	7,627,289	\$ 353,975.75
January 1 to December 31, 1893.....	21,516,246	1,709,094.89
January 1 to December 31, 1895.....	33,508,129	1,116,128.29
January 1 to December 31, 1897.....	18,852,224	1,377,647.65
January 1 to Dec. 31, 1898.....	27,718,560	1,879,681.90
Grand total.....	109,461,873	\$6,427,523.51

Average value per ton, \$58.65.

Mining property purchased from April 1 to December 31, 1896, \$619,943.

Permanent equipment purchased, including Burns shaft, \$228,212.95.

On Rock creek, in Montrose county, some development work is being done on the Copper Prince mine and other claims. The Copper Prince mine has recently developed into a great uranium ore producer. An analysis made by the State School of Mines returned a high percentage of pure oxide of uranium. There are also values of gold, silver and copper in the ores of this mine. Gold values as high as \$200 have been obtained. The uranium ores have been exposed in a number of places along the ledge for a distance of 1,200 feet. Samples of these ores shown are marvels of beauty. The development in this phenomenal mine of large bodies of this rare and valuable mineral adds another gem to the crown of mineral wonders for which Colorado is noted.

## IDAHO.

### Rich Strike at the Hiyu.

Two feet and a half of solid high grade ore has been encountered in the shaft at the Hiyu, near Florence, at a depth of between seventy and eighty feet below the first level. The shaft is going down at the rate of a set of timbers for every two shifts, and is now nearly one hundred feet below the first level. The work of sinking will continue to the depth of two hundred feet below the first level. The managers are highly pleased with the showing, as they did not expect to have any ore in the shaft at the depth attained.—*Florence Miner.*

## KANSAS.

The Missouri and Kansas mill on the Masin ground ran right along during the recent great cold spell, as they get their water to run their machinery from the pump shaft and managed to get it into the boiler before it froze. They have a big run of both lead and jack, and average about 50,000 pounds of zinc and 40,000 of lead weekly, and this week they will beat that, as they have been crowding things on account of the high price of ore.

## MICHIGAN.

### A Copper Cave.

The Chicago mine at Wakefield started its pumps on February 16th. This mine has been idle six years, although it is known to have a large body of high grade ore. The mine is next to the Brotherton, on the edge of Sunday Lake. Six years ago a drift was dug several hundred feet under the lake, and an opening struck which proved to be quite an extensive cave. Strange to say, it was dry. Civil Engineer W. J. Oppen, of Bessemer, was sent for to make a survey of the cave. The next day a rush of water came when he had measured the height at 50 feet, but had no time to do any more work. The opening was supposed to be from the lake, and the mine has been under water ever since. The cave will be explored as soon as the mine is cleared of water.—*Hancock Copper Journal.*

## MINNESOTA.

A bill introduced in the Minnesota legislature for a bounty on every ton of pig iron manufactured in the State met with disaster. The bill had it passed would undoubtedly advance Minnesota's position as an iron ore producer, and much of the ore produced would have been manufactured into pig within the borders of the State. As it is, Wisconsin and Michigan legislatures passing similar bills, the ore produced in Minnesota will be sent outside the State to be made into pig, resulting in a loss to the people of the latter State.

## MISSOURI.

Another big strike on the Kohinoor was made in a new shaft being sunk by Grounds and Irwin, W. S. Crane, F. Commons, C. W. McAbee and others. The lead was struck at 145 feet and comes out in large nuggets. A strike of this kind on the Kohinoor means a rich mine.

The big pumps on the Manhattan, formerly known as the Victor, were started up by W. B. Kane, and the water was lowered several feet in a few days. As soon as the ground is drained a force of men will be put to work and the old Victor will figure in the statement of the weekly output once more. There is an immense ore body on this lease and three or four shafts down all in big ore. Green B. Young, of Joplin, was formerly superintendent of the Victor, which under his management was one of the most prosperous properties in the district. The lead turned in from the Manhattan is taken from an old cave on the south of the Star lots on the Chatburn, and three men in the ground clean up enough every week to more than pay the expenses of running the pumps.—*Joplin Herald.*

## MONTANA.

The officers of the United States land office in Butte, have just received a decision of the United States Land Commissioner Hermann, that is of especial interest to the residents of that section on account of the fact that the contestants are Butte parties. The decision denies the application of Margaret McRae and Mary Sloan for a hearing to set aside the patent for the Brown Girl quartz lode.

It appears that the mineral land in dispute

was patented to claimants as placer diggings and was subsequently transferred to the Boston & Montana Consolidated Gold & Copper Mining company. The contestants subsequently attempted to file on it as a quartz claim. The case has been in the state courts for a long time and was finally decided by the supreme court against the contestants.

The Senate committee on mines and mining has recommended the passing of the Shovlin co-tenant bill. The bill as amended has already passed the house and if the senate adopts the report of the committee and concurs in the bill, nothing more than the signatures of Speaker Stiff, President Spriggs and Governor Smith will be required to make it a law.

Perhaps no bill before the Sixth legislative assembly has caused so much discussion as the Shovlin, which was the first bill introduced in the house. The bill gives co-tenants the right to enter upon and operate property held in common and is designed to prevent small joint-owners from being "frozen out" by corporations or individuals who hold the principal interest in a property. As amended the bill permits a joint owner not consenting to the operation of a property to take his proportionate share of the ore mined by the working co-tenant or co-tenants or his share of the net milling proceeds as he may elect.—*Helena Independent.*

## NEVADA.

Chas. H. Wilbur, superintendent of the Golden Eagle mine, near Winnemucca, Nev., was in Salt Lake, Utah, and reports the property in most favorable shape. The outlets from the mine during the past few weeks have been in wretched condition, says Mr. Wilbur, and during that period the hauling of the ore was simple impossible. However, the teams began hauling ore again and will continue delivering it as rapidly as possible. The mine has considerable shipping ore exposed, while ore of good milling quality has been followed all the way down the shaft. Mr. Wilbur says the proposition never looked so well. During the past ninety days over 300 tons of good milling ore has been added to the large amount already on the different dumps.

## NEW MEXICO.

A strike of very rich ore was made on the Union mine during the week, some of the ore showing native silver and also running high in gold. The width of the lead at the point where the rich ore was encountered, has not yet been ascertained, but enough is now in sight to place the Union in the front rank of Cochiti mines. The lucky owners are George Hosheins, M. L. Cole and Ed. Smith of Bland and Ed. Lembke and H. B. Ferguson of Albuquerque.—*Bland Herald.*

Most of the men employed on the Copper Hill mine near Taos, have been laid off, awaiting the arrival of machinery. A hoisting plant with a gasoline engine has been ordered and will soon be in place. Work has been applied on the vein on both sides of the hill until the company is satisfied that the ore is there. Now they intend to sink an 8x15 foot shaft from the top and crosscut to both sides. Work will start again in two or three weeks.

## OREGON.

## The Sale Is Off.

It is authoritatively stated, in fact it is an open secret in the camp at Cornucopia, that the deal for the purchase of the Cornucopia Mines of Oregon in process of promotion by Fink & Campbell, the Spokane brokers, to Youngtown, Ohio, capitalists, is off, and the management of the mines have in process of carrying out important improvements on the Last Chance and Red Jacket mines, which, when matured will make these already good producers the largest paying mines in Oregon. It is proposed to put in a large electric plant on Pine creek, construct a huge tramway and run many hundreds of feet of tunnel, the estimated cost of which will aggregate \$100,000—*Baker City Democrat.*

## SOUTH DAKOTA.

The rich strike of ore in the Norwich claim, one of the properties of Joe King, located in the Strawberry district, is attracting considerable attention. The claim is under lease to Morrow, Shaw, Stokes and associates. The ore is free milling and was found in a new shaft started in an old tunnel, which had been worked years ago. The richest ore comes pockets and it is estimated that the value of the ore is from \$40 to \$60 gold to the ton.

Work has been resumed again on the 20-stamp mill, which is being erected at Gayville by the Baltimore and Deadwood Co. The mill is nearly completed and it is thought that two more weeks will see everything in place.—*Black Hills Mining Review.*

## UTAH.

The stockholders of the Daly-West Mining Co. met in annual session on the afternoon of Feb. 20th, and elected their directors for the ensuing year and adjourned, after the cheering assurance that dividend No. 1 would be distributed among them in June next.

It was the first meeting since the harmonization of interests that were in bitter conflict for so long a time, and if there were any animosities remaining they were wiped out entirely by the pipes of peace that prevailed at this meeting. Of the 150,000 shares 134,165 were represented, either in person or by proxy, when the following directors were elected: John J. Daly, R. C. Chambers, Chas. Reed, Allen Fowler and O. J. Salisbury, the hand of fellowship going out to Directors Chambers and Reed as the representatives of the Haggins-Hearst interest.

The last cyanide shipment of the Geyser-Marion, at Mercur, netted the company \$7,000.00.

The Mercur mill of Mercur was forced to close down for several days, owing to the deep snows and the inability of the railroad to deliver ore.

The annual meeting of stockholders of the Northern Light was held on the 20th ult. A snug sum of money is reported to be in the treasury of the company, and the superintendent's report was very encouraging.

Some fine shipments of high grade copper and gold ore are coming in from the Centennial-Eureka at Eureka.

The management of the Chloride-Point, of Mercur, has been put to considerable trouble of late, owing to the failure of the electric company to furnish power. There is a renewal of the rumor of a dividend.

## WASHINGTON.

Free gold was struck last week in the Butte and Boston mine at Republic Camp, Wash. The whole drift is in rich ore. The strike was evidently made while drifting north on the new ore body at a depth of 210 feet toward the Jim Blaine ground. J. H. Wilmot, vice president, gave the latest values taken from the face of this drift as \$40

"The San Poil mine, at Republic, never looked so promising," said an officer of the company. "I have just been up to the company's office, and there is a string of daily assays there, covering two weeks' time, which is calculated to warm the heart of a stockholder. Of course there is an occasional low assay, as is always the case, but the average is up to a comfortable sum, and day after day of late the assays have run \$80 per ton and better, both in the winze, which is being sunk from the No. 1 to the No. 2 level, and in the raise."

At Republic, the Lone Pine ore chute running east and west has been proved to be fully 200 feet long and averages about 9 feet wide. Mr. Clark estimates the average value of all the ore in the chute at \$40 per ton. The present values are running steadily between \$60 and \$70 across the face of the drift, which is running east on one of the famous Lone Pine cross ledges. It is estimated that the Lone Pine will be ready for a mill as early as it can be installed in the spring. The development has proved the property one of the wonders of a wonderful camp.

## FOREIGN MINING NEWS

## BRITISH COLUMBIA.

Ore has at last been struck in the lower tunnel of the True Blue. The property was bonded last fall to the Hall Mines, Limited, and ever since the company have been patiently exploiting the property, while residents of Kaslo, not so patiently, have been awaiting the result, which if successful means a large mine at the very boundary of the corporate limits. This, it seems, is now an accomplished fact as twelve inches of clean ore was encountered in the lower tunnel. Mr. Stevenson, who was one of the original locators of the property, and is now foreman at the mine, was in town and when questioned in regard to the rumor of a strike he confirmed it fully, giving the particulars. They are now sinking on the ore body, which is apparently solid and in place. The ore shoot is said to average from 9 to 15 per cent copper, beside small values in gold and silver, and if continuous will without a doubt prove the judgement of the company's expert to have been well founded when gave a favorable report of the property.—*Kootenaiian.*

## LOWER CALIFORNIA

J. W. Dawson, of Los Angeles, has just returned from the Cedros Island where he has been examining the property of the Cedros Island Mining Company, of which Otto Schuleburg, of St. Louis, Mo., H. A. Howard, of San Diego, Cal., and others are the owners. Otto Schuleburg owns 51 per cent of the stock, and W. A. Clark, the copper-miner of Montana and Arizona has practically agreed to purchase this stock, if the property is what it is represented to be. It

is also understood that the rest of the stocks will be secured later. Mr. Dawson found a very rugged country and an immense body of ore, though low grade.

The opening of the California and Oriental Steamship line is expected to have a good result upon the iron mines of San Isidro, fifty miles south of Ensenada, Lower California. It is said that the fact is demonstrated that the ore is particularly adapted to the making of steel. The owners of the mines are receiving many inquiries about prices and facilities for filling orders. The deposit of iron, which is said to be capable of making the finest Bessemer steel, and is superior in quality to most iron ore used in the United States, is at San Isidro, within 600 yards of the sea, and so situated that the ore can be loaded upon deep-sea vessels at a comparatively small outlay of expense. The ore is in great beds which crop out above the surface over a large area. Experts who have come from Pennsylvania and other parts of the country to examine the ore have pronounced it very valuable, and experiments made in rolling mills have confirmed this opinion.

The deposits were discovered many years ago, but it remained for men of the present day to take proper recognition of the iron and introduce its good qualities. The deposit is generally known as the Tepustete iron mines, but the Tepustete mine, which is owned by Gen. W. E. Webb of San Diego, comprises only a part of the great bed of iron. Adjoining the Tepustete are the large iron deposits owned by Don Manuel Riveroll of San Diego, and which are officially known as the Jupiter, Prometeo, Marte and Mercado mines.

## ONTARIO.

Finds of gold are not the only fortune-makers these days. From B. W. Goodsell of the Goodsell Packing Company, Chicago, it is learned that of recent date one of the richest copper mines east of the Rocky Mountains has been opened in western Ontario. Mr. Goodsell is vice president of the mining company engaged in laying bare this great copper deposit, and he, with the other stockholders, firmly believes that millions of dollars are within the reach of human hands and machinery. The owners and incorporators of the company have named their corporation the Rock Lake Mining Company, Limited, the officers being: President, M. Wile, Buffalo; Vice president, B. W. Goodsell, Chicago; Treasurer, B. G. Coryell, Chesaaning, Mich.; Secretary, L. C. Holden, Sault Ste. Marie; Superintendent, A. S. Burrows, Sault Ste. Marie, Ont.

The Rock Lake mine is situated southeast of Batchawang Bay on the north shore of Lake Superior, eleven miles north of Bruce mine, and not far from Rock Lake, from which it takes its name.

The vein now being opened is believed to be the mother vein of the copper belt of that district. This belt extends southeasterly from Batchawang Bay on the north shore of the great lake to the north channel of Lake Huron, a distance of nearly 100 miles. In many localities the outcrop can be traced still further—in fact, for miles across the barren mountain ranges.

A careful assay of a ton of surface ore recently scooped up shows the following results:

Copper, 6½ per cent.  
Sulphur, 9.51 per cent.  
Gold, \$3 @ \$4 per ton.

The gold assay came from the leaner streaks

inside the walls. It is stated that every foot of depth adds to the richness of the lode. The company understanding this, is bending every effort to bring the buried treasure to the surface. An air compressor and power drills were lately put in place. With these the mine is to be opened at a depth and then worked to a capacity of 100 to 200 tons of pay ore daily. A concentrating plant of 100 tons capacity is about to be established at the mine, to be in operation within a few months.

The Rock Lake Mine Company is capitalized at \$1,000,000, in shares of \$10 each. Since the mine has given signs of such exceptional richness the company has withheld its stock from the market until deeper ground has disclosed the real value. Compared with other copper mines it is claimed by the owners that in actual value their capital stock could be increased to \$3,000,000, and would pay dividends on a much larger amount.

So sure of their property are its controllers that immense sums are soon to be expended in developing it. A charter for a railroad from the Rock Lake Mine to Lake Huron and the Canadian Pacific system has been applied for. The railroad is to be built as soon as permission is granted by the dominion government. This little road will not only furnish an outlet for the mining product, but will open up new sections of country well stocked with minerals and sprinkled thickly with pine and other woods of value.

Mr. Goodsell says his company has received the greatest consideration at the hands of Canadian government, it being evident enough that the Canadians are ever ready to welcome Yankee capital, energy and enterprise.

## Latest Mining Decisions.

Prepared by Andrews & Murdoch, Berrien Springs, Mich.

The owner of an unpatented placer claim, or another with his consent, can locate a lode claim within the boundaries of the placer claim. McCarthy vs. Speed, 77 N. W. Rep. (S. D.) 590.

One who performs labor on a mining shaft, tunnel, level, chute, stope, uprise, cross cut, or incline is entitled to a mechanic's lien on the mine for such services. Hines et al. vs. Miller et al., 55 Pac. Rep. (Cal.) 401.

Non-compliance with the miner's rules, or with the state or federal laws, regarding locations, works a forfeiture of the claim, whether such rules or laws so provide or not. Sissons et al. vs. Sommers, 55 Pac. Rep. (Nev.) 829.

Citizenship of one, and his rights to a mining claim dependent thereon cannot be questioned in an action between him and other individuals to determine adverse claims to mining property. McCarthy vs. Speed, 77 N. W. Rep. (S. D.) 590.

Where an employee of a mine is injured by falling roof, his own negligence contributing to the injury, he can not recover from his employer unless the latter was guilty of willful neglect, or failure to furnish props when requested to do so. Sugar Creek Coal Min. Co. vs. Peterson, 52 N. E. Rep. (Ill.) 475.

Persons who locate a lode claim, and record their location certificate, are estopped as against one to whom they sell an interest in the claim after an examination of the records, to assert that there was no discovery to support the location. McCarthy vs. Speed, 77 N. W. Rep. (S. D.) 590.

The proof being sufficient to support the

finding that the location of a certain mining claim was substantially in compliance with section 2324, Rev. St. U. S., a conflicting, but subsequent location has no rights to the ground in conflict. Argentine Mining Co. vs. Benedict, 55 Pac. Rep. (Utah) 559.

The fact that two claimants under oil leases, at whose instance a receiver had been appointed, fail to sustain their claims, will not necessarily require that the costs of the receivership shall be charged to them, rather than to the funds in court, which are part of the subject of the receivership. Elk Fork Oil & Gas Co. vs. Jennings, 90 Fed. Rep. 767.

St. 1897, p. 103, §2, requiring the locator of a mine, in order to hold his claim, to sink a discovery shaft, or make a cut of certain depth, within ninety days after location, is not in conflict with the act of congress which gives to locator one year to do the \$100 worth of labor prescribed by congress as a condition of holding the claim. Sissons et al. vs. Sommers, 55 Pac. Rep. (Nev.) 829.

In an action for personal injury caused by coal falling from the roof of defendant's mine while plaintiff was working therein, the latter cannot show, for the purpose of showing that the defendant had notice of the dangerous condition of the roof, that previously, at another place in the roof and under different conditions coal had fallen. Sugar Creek Coal Mining Co. vs. Peterson, 52 N. E. Rep. (Ill.) 475.

The attempt of an agent employed to do the annual assessment work on a mining claim, after failure to do the work, to relocate the claim is a fraud on his principal. When such attempted relocation was in the name of the company of which the agent was manager and superintendent, the company must be held to have had knowledge of the fraud. Argentine Mining Co. vs. Benedict, 55 Pac. Rep. (Utah) 559.

Under How. Ann. St. §8408, providing that laborers in mines shall have liens for wages due, which shall take precedence of other debts, liens or mortgages, and that such liens may be enforced in the same manner and under the same limitations and regulations as are provided for the enforcement of other liens, a labor lien is superior to a mortgage lien although the latter is prior in time. Atlantic Dynamite Co. et al. vs. Ropes Gold & Silver Mining Co. 77 N. W. Rep. (Mich.) 938.

Pending the determination of the title of certain oil lands, the court appointed a receiver to take charge of and develop the property, the necessary funds being furnished by the title claimants, with the understanding between them that they were to be refunded to them from the sales of oil, would be the same be sufficient. Held that, the title to the land having been found to be in one claimant, the other was entitled to such reimbursement. Elk Fork Oil & Gas Co. vs. Jennings et al., 90 Fed. Rep. 767.

## GENERAL NEWS

The American Impulse Wheel Company of New York report some very large Electric Transmission work in hand and most valuable results from all their installations. The Company is getting a large home and export trade, etc.

The Tenth Annual Report of the Inspection of Mines of the State of Montana, for the year ending November 30th, 1898, has been issued by John Byrne, Inspector, embracing conditions of mines of Montana, and accidents in same; also the commendable report of Deputy Inspector Frank Hunter. The report contains 54 pages of closely printed matter—valuable information for investors in Montana, and shows more and more the necessity of an inspector of mines for California.

The amount of "Rainbow Packing" made by the Peerless Rubber Manufacturing Co. of New York, sold in 1898 was over fifteen hundred tons. Letters entirely unsolicited are almost daily received in which engineers who have used it, commend it for its excellent qualities, and the fact that they having once used it, absolutely refuse to try any other is convincing proof of their faith in it. Testimonials from the users of the Peerless Rubber Manufacturing Co.'s goods, both at home and abroad, confirm the fact that "The Peerless line of packings are without equal."

Three of the most valuable technical works, books that could be added to any library have just been received at this office. Commercial Organic Analysis by Alfred H. Allen, F. I. C. F. C. S., \$3.50. Physico Chemical Methods by Dr. J. Traube, Privatdozent in the technical high school of Berlin, translated by Millett L. Harden, Ph. D., \$1.50, and Introduction to Chemical-technical Analysis by Prof. F. Ulzer and Dr. A. Fraenkel, with appendix by the translator, Herman Fleck, Nat. Sc. D., \$1.25. Each work covers the subjects treated very exhaustively, no chemist can afford to be without them. P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia, Pa., will furnish full information.

## Standardized Iron Drillings.

Thos. D. West, Sharpsville, Pa., Chairman of the American Foundrymen's Associations Committee on standardized iron drillings, reports that up to Feb. 1st there were 19 Blast Furnaces, 17 Steel and Iron Works, 13 Colleges, 11 Iron Foundries and 10 private laboratories using its standards, description of which appeared in the JOURNAL Feb. 1st, page 8, and also reports that he is in receipt of many letters praising the utility and excellence of the samples being sold to the trade and the greater confidence they render to laboratory work being uniform throughout the country.

## Morgan-Watson Mining and Construction Company.

The firm of Morgan-Watson, of Cleveland, Ohio, are in a sense a new institution, having recently associated themselves together for the purpose of conducting a general mining and stock business handling nothing but that which they know are good securities. Mr. Francis Morgan of this firm is an old operator in mines and stocks, having been in the business for the past sixteen years, during which time he has mined in Mexico, the west, and the Lake of the Woods of Canada. One of the principal features of Morgan-Watson is that of developing first class prospects. Both of these gentlemen are members of the Cleveland Mining Exchange, and are the organizers of that institution. Mr. Morgan is also a member of the Cleveland Chamber of Commerce.

## KANSAS LEAD AND ZINC.

[Continued from our issue of February 15, 1899.]

## GEOLOGY OF THE ORE BEARING FORMATIONS

The lead and zinc ores of southeastern Kansas occur in the Mississippian or subcarboniferous limestone formation, which has a wide exposure in southwest Missouri, northwest Arkansas, and southeast Kansas. In Kansas but a small area is covered, one forming approximately a triangle in the southeast part of the state, six miles wide at the base along the south line and ten miles high along the east. The northwestern limit is approximately determined by the position of Spring river, but not entirely so, as the same formation is found in many different instances either at the surface or only a few feet beneath for a few miles to the west of Spring river. In Missouri, according to the geological maps of that state, the subcarboniferous covers thousands of square miles in the southwest corner, and forms a narrow strip reaching to the northeast to the limits of the state. To the south of Missouri it covers a portion of northeastern Indian territory and a large part of northwestern Arkansas.

Lead and zinc ores have been found in greater or less extent in many places in southwestern Missouri, northwestern Arkansas, and northeastern Indian territory, but the heaviest ore deposits thus far discovered are confined to a small area lying in the vicinity of Carterville and Joplin in Missouri, and Galena in Kansas.

This particular geological horizon is different in many respects from any other one known in the whole geologic column. It is essentially a limestone formation, but here and there, in many places throughout its vertical and horizontal extent, the limestone is almost entirely replaced by flint rock, which forms extensive masses, sometimes measuring hundreds of feet in thickness. The flint seems to be primary in origin, the indications implying that it was formed at the same time the limestone was. It is frequently almost pure silica, often containing but a mere trace of foreign matter. Its general character has been described so often in various places that details need not here be given. It does not exist in equal abundance uniformly throughout the subcarbonaceous formations. In some places the limestone constitutes the permanent feature of the terrane, while elsewhere the limestone is scarcely visible and the flint is prominent.

Usually the ore is found entirely within the flint masses; that is, in openings surrounded by the flint beds. There is practically no instance known of the ore occurring in the limestone, as is so generally the case in other lead and zinc mining districts, such as southeastern Missouri, northeastern Iowa, and southwestern Wisconsin. The flint has been fractured to so great an extent that it would be difficult to obtain a cube six inches across which did not have a number of fractures within it. Associated with the limestone as it is, large quantities of limestone may have been dissolved out, leaving the flint to appear all the more prominent. In some way, and by some processes, myriads of openings, of almost an infinite variety in shape and size, have been produced. The rock volume has been greatly contracted, either by the dissolving out of the limestone or other rock material, or some other process, producing underground open spaces. Here is a chamber some feet in extent; there is a seam unaccountably widened to six or twelve inches; here is a fracture line one-sixteenth to one-thirty-second

of an inch in width—cavities of all descriptions and of all sizes. Such cavities are more or less filled with the lead ore and the zinc ore. No matter how irregular in size, shape, or position, the ore has been deposited in them from watery solutions.

Along with the ore is a variety of silicious material, secondary in origin, which has also been deposited from water. At some of the mines it constitutes the main mass of material in the dump piles, while elsewhere it is present to a much less extent. This material has been named jaspelite by Jenny, and is fully described by Winslow in his reports on the lead and zinc ores of Missouri. It is most intimately associated with the ores wherever it is found, the two apparently having been deposited at the same time.

The depth at which ore is found varies exceedingly. In some places it is observed at or near the surface; elsewhere a shaft must be carried 100 feet or more to reach it; while in many places it would seem from the small amount of deep prospecting done that ores exist at a much greater depth—from 200 to 250 feet—with no apparent indications of the same near the surface. Many instances are now known where a territory once prospected to a considerable depth and abandoned as unproductive has since become a great producer by deeper mining. The most notable of these, perhaps, is the North Empire territory. Here, in the little valley, many shafts were sunk in early days of mining, from 1877 to 1880. Almost no ore was found. After nearly fifteen years of waiting it was discovered that one of the richest bodies of ore ever yet reached lay but a few feet beneath the bottom of these old shafts. During the past eighteen months perhaps the North Empire area has produced more ore than has ever been taken from an equal area in a similar length of time, unless it should be the Short creek valley, where lead ore was first discovered.

There is no regular geological difference between rocks near the surface and those at a greater depth. It cannot, therefore, be determined why, in some cases, the ore is so near the surface and elsewhere so far below. Occasionally a limestone mass is found before the shaft has reached a very great depth, and this must always be passed before ore in large quantities can be found. In some places in the North Empire territory limestone has been drilled through and large ore bodies found immediately underneath. It seems that in some way the depth of the ore may possibly be dependent upon the water level in the ground. Where the conditions have been such that the water level was far from the surface, the ore usually is found likewise at a great depth. It will not do to pass judgment on this even by using the water levels as we now find them, for in some parts of the country, particularly on the land belonging to the South Side Mining Company, large bodies of ore lie above the present water level and can be taken out without any difficulty from water in the mines.

Throughout the whole mining region of Galena and Joplin a belief has been prevalent among the miners that the ore rarely, if ever, occurs beneath a body of limestone. It is a common saying, even yet, that if limestone is reached in sinking a shaft the shaft should be abandoned. This is generally true provided the parties do not have sufficient capital to carry the shaft a number of feet in limestone, for frequently the limestone bed will be from ten to twenty or even more feet in thickness, and the expense of sinking a shaft through such a formidable obstacle is

greater than many of the prospectors can bear. It has been proved in many places during the last year, however, that the mere fact of the existence of a bed of limestone at any particular place practically argues nothing of the possibility of a large ore bed lying underneath. Wherever the flint exists in large bodies and has many openings through which the water can pass, there one may expect to find the ores, entirely independent of the character of the material which exists twenty-five or fifty feet above.

## PROCESS OF MINTING COINS.

BY ALEXANDER B. OTTERBROOK.

[Continued from our issue of Feb. 15, 1899.]

The machine also requires the constant attention to supply the blanks or planchets, and frequent attention of the expert adjuster of balances. When the additional cost of steam power and wear and tear of the parts is added to the original cost of the apparatus, its merit from an economical point of view is not so great as would at first sight appear.

The next operation to which the blank pieces are subjected is to impart the raised edge, technically called "milling."

The machine used for this purpose is an American invention, and is admirable for its simplicity as well as for the rapidity with which it accomplishes the work.

The blanks are fed by an attendant into a tube, and they are drawn horizontally, in single file, through a gradually narrowing channel formed by a groove in the periphery of a rapidly revolving disk on one side, and a stationary segment of corresponding curve on the other, keyed a little closer to the wheel at one end. The blanks are in this way compressed on the rim, acquiring the "milled edge." This machine is capable of milling as many as 1,200 pieces per minute.

The blanks are now taken to the pickling vats, where they are immersed for a couple of minutes in weak sulphuric acid, for the purpose of removing the black oxide of copper, they are then washed in pure water and placed in a rotating cage filled with sawdust. This rapidly dries the blanks, and when removed to the coining room they have acquired a fine surface.

*The Coining.*—The early methods of coining were exceedingly crude and imperfect. The metal was hammered into a thin plate; pieces of irregular size were cut out and beaten into a bullet shape; this bullet was placed on a sort of anvil having the reverse die cut upon its face.

The obverse die was held in the hand like a punch, and by the aid of a heavy hammer the bullet was flattened out and coined at the same time.

There are many interesting specimens of this antique coinage to be seen in the Mint cabinet. The oldest are to be found in the case devoted to coins of the Greek Republic, dating back to seven centuries before the Christian era. It was not until the middle of the sixteenth century that the forge and hammer were succeeded by more scientific methods.

Formerly coins were struck in presses worked by a screw; but we adopted, many years ago, the admirable invention of a Frenchman, named Thenoilié, which has been further improved upon by the skill of a former coiner, the late Mr. Franklin Peale. This machine operates on the mechanical principle of the "toggle joint" (of which the elbow-joint is a familiar example). It is con-

trolled by a lady who feeds it with the blanks which she places in a vertical tube. A pair of "feeders" catch the bottom piece and carry it forward, where it rests in the "collar" between the upper and lower dies; the lever is now descending with the upper die while the lower die remains fixed; the pressure increases with perfect uniformity up to the maximum, which is equivalent to about 10 tons for the dime, 80 tons for the double eagle and 120 tons for the silver dollar. The pressure gradually decreases again by reason of the relaxation of the upper joint, the lower die pushes the piece out of the collar into which it has expanded, and from which it has acquired the "reeded edge." Meanwhile, the feeders have provided another blank, and as they bring it forward they push the coined piece into a channel, through which it slides into a box beneath the machine. The coins are then inspected by the foreman, and any cracked or defective pieces set aside.

The larger denominations of coin are counted by hand, and the smaller pieces, as well as the "bronze" and "nickels," are numbered by means of a simple and ingenious arrangement called the counting board.

After the coins have thus been counted and weighed, they are tied up in linen bags and delivered to the treasurer in drafts of \$5,000 each. The accuracy of the adjustment of the weight is so nice that there is rarely a deviation from the true standard weight of as much as one one-hundredth of an ounce in any delivery of either gold or silver coin.

As a final precaution, the assayer is required by law to select at random one coin from every lot of \$20,000; these are sealed in envelopes, numbered, and placed in a strong box provided with two locks; the key of one is kept by the treasurer and the other by the assayer. These sample pieces are called the "pyx." They remain sealed until the Commissioners appointed by the President assemble at the "annual assay" in February of each year to test their purity and weight; and it has rarely happened that any piece has been found to exceed the small limit of "tolerance" allowed by law.

The manufacture of the dies for coin requires a high order of artistic and mechanical labor, involving the talent of the designer and the skill of the engraver and sculptor. A detailed description of the processes involved would necessarily extend this paper beyond the limits assigned to it. A brief outline must, therefore, suffice. The artist first makes a free sketch on paper, he then models his design in wax upon a glass plate, and it is probably five times the size intended for the coin; from this he takes a cast in plaster, which serves, when coated with plumbeago, as a matrix, from which an electrotype in copper is obtained. The electrotype, after being finished by hand, is used as the model from which the steel die is cut by means of a reducing pantographic cutting machine, somewhat similar to those used for reproducing designs for steel rolls used in making printed fabrics. A traveling pointer attached to the long arm of a lever is caused to move back and forth over all portions of the raised model, and a steel drill attached to the short arm is thus caused to cut the design in a block of steel corresponding in all its details to the model, but reduced to the proper diameter for the coin; the stars and lettering are now added, and the whole is finally touched up by the hand.

This design is called the "Hub" or "Master die," from it the coining dies are made and reproduced in any number required. A

block of steel having been softened by annealing, is placed in a screw press carrying the "Hub," and by a succession of blows, followed by frequent annealings, the die from which the coin is to be made is produced.

It is possible (owing to the great value of the raw material) to bring the processes involved in our gold and silver coinage to a perfection which would not, perhaps, be found profitable in any ordinary industry; and this fact, together with the national pride which is felt in the matter, should offer encouragement to the invention of all practicable methods of producing perfect work and preventing losses.

#### PLACER MINING IN CALIFORNIA.\*

(BY PROF. ARTHUR LAKES.)

Mining for gold in California commenced, as elsewhere, by placer mining and then led up to vein mining. Now vein mining is in the ascendency, and for a time (it may be hoped only for a time), the vast placer industries are very much in abeyance. How vast the placer resources were, and are, and what a huge amount of material has been moved by the miners in days gone by is brought forcibly before the traveler as he crosses the Sierras, or looks down into the wooded depths of the great canyons of the American and other rivers that cleave the Sierras from summit to base, and sees the great patches and white hummocks of abandoned placer ground. Or again, if he goes into the more northern sections of the state he sees the huge banks of debris, hundreds of feet thick, and the rusty idle monitors pointed at the cliffs they have done so much to reduce, whilst miles upon miles of great flumes and rusty pipes tell of the energy which brought the water in enormous quantities and with mighty force from afar. We look upon a comparatively dead industry, yet are impressed with the idea of how great it could be again, if it were one revived by the laws which at present arrest it.

The regular open hydraulic mining has practically ceased, but drift mining, as it is called is still maintained, the debris being not so formidable a detriment to the rivers and agricultural interest, nor coming under the law as is the case with the regular open hydraulics.

Drift mining consists either of running a tunnel at bedrock or on an old river channel in a placer bank, with a lofty heavy body or cliff of placer material above of not so great value as that at bedrock; or it may be running a tunnel in under a sheet of lava which has filled up an old river channel, almost to bedrock, and extracting the pay ore between it and bedrock. Drift mining then "is defined as the process of tunnelling and breasting, by which comparatively shallow strata of gravel are excavated without the removal of the deep top covering, either of poor gravel, valueless capping, or lava rock." Generally this kind of gravel is tightly cemented together, and has often to be blasted out. Sometimes when freer it can be sluiced. Since the stoppage of hydraulicking attempts have been made to work the great channels near bedrock surmounted by their losty cliffs of debris in this way, but not always with the success anticipated, the method employed being too expensive.

There are, as is well known in California, two systems of rivers bearing placer material; the ancient dead rivers with buried courses and the present river system. The courses of

the present rivers follow very nearly those of the ancient rivers, but sometimes cross them. The ancient river systems are naturally the most interesting. The size of these varied greatly from small tributaries a few feet in width up to the great stream whose bed lies upon the San Juan ridge north of Nevada City for 25 miles and to a depth of gravel of 500, and a width of one to one and a half miles, surpassing anything now existing in the state. From the effects of general erosion, these old river channels may occupy to-day a more elevated position than the present neighboring streams. Then with the elevation of the Sierras, enormous flows of lava issued from fissures, covering many of these river beds to a depth of hundreds of feet. So the old channels were buried and the direction of the water courses diverted with a result that the old channels are now covered deep with a volcanic top dirt. The composition of these gravels represents nearly every rock known in the country, such as diabase, diorite, serpentine, slate, granite, syenite. In some cases, however, the pebbles are almost wholly of quartz, and in one case that we observed, of pure white quartz, as if from some gigantic vein of that material. The lowest gravels have a gray blue tint from iron peroxide and other causes; hence the celebrated so called "blue lead" of California. Sometimes this color is due to dark volcanic ash or volcanic material.

Desirous of seeing typical examples of some of the great old abandoned placer banks and works, as well as of the active drift mining, we directed our steps to Nevada City, and later, to North Bloomfield, at which latter place is probably the greatest placer deposit, and once was the scene of the greatest placer mining in the world. The placer formation lies along part of the ancient San Juan River deposit extending from Nevada City to North Bloomfield and beyond. Drift mines are also located on a portion of this deposit near Nevada City on what is called the Washington Ridge of the ancient river channel or channels, which underlie it. The channels follow the course of the ridge.

The ancient rivers, whose beds lie inclosed, follow the direction of the modern streams, which have eroded on either side and produced the ridge. The ridge is capped in places with volcanic rock. The bedrock has an elevation of 2,650 feet. The depth of the gravel is 200 feet capped by 300 to 400 feet of lava. The bedrock is decomposed soft granite often containing large, hard boulders. The profitable gravel lies directly on bedrock, varying from a fine free gravel, easily sluiced of its gold, to a cemented gravel found in the deep channel in which the Harmony mine is located; gold is often plainly visible. In the channel proper, the high grade yields from \$2.50 to \$13 per ton. The gold occurs like coarse shot. As the gold works its way down into the soft bedrock, in breasting, the top six inches are taken out with the gravel. The depth of the pay gravel stratum is two to six feet. The mines attack the channels by incline shafts and bedrock tunnels, extending from the bottom thereof into the channel to avoid very long tunnels, and the cost of driving through excessively hard ground that would be met with when going through the high beds. Augers are used to put down holes in preference to ordinary drilling. Three thousand feet of the Nevada City channel has yielded \$4,500,000. A rich channel in the Harmony mine is said to run \$10 to \$12 per ton, when crushed in stamp mills. This channel is regularly blocked out, leaving a

pilar between the rim and the channel extracted; as the bedrock swells rapidly, it is advisable to keep dead work just far enough ahead so as to have a new block ready when the old is finished. The timbers are considerably spread as sets with spreaders are rapidly broken, it is found better to let the floor rise and cut it down whenever necessary. The Harmony Drift gravel is an ancient river channel, the gravel composed entirely of quartz pebbles and boulders lying on bedrock covered with pipe-clay, sand, and different gravels. The top of the deposit is surmounted by a capping of lava; the depth of quartz gravel is two feet, the volcanic capping 400; bedrock is a decomposed granite containing hard boulders. Two channels exist in the upper portion of the ground, one turning east, the other northeast. The Harmony channel has a width of over 200 feet. The gravel is not tightly cemented, but contains a clay which renders washing in sluices very ineffectual the gravel being composed of quartz containing gold. It was found that in washing, less than one-half of the gold was recovered. On the West Harmony mine the depth of gravel is 2 to 5 feet. In the deep channel the gravel is more cemented. This appears to be the main channel.

Besides the Harmony mines, there are numerous others on this ancient river bed near Nevada City, such as the Manzanita, Odin, Yosemite, Fountain Head, Cold Spring, Yuba Mesa, and others. Our road from Nevada City to visit the North Bloomfield placer district lay through a rolling and beautifully wooded region, clothed with black oak, sugar, and white pines. Then we drove down into the profound and wooded canyon of one of the branches of the Yuba river, and climbed the opposite bank. The rocks exposed on the side of the canyon appeared to be schists and serpentines. After reaching the summit we caught glimpses between the trees of snow white cliffs, glittering in the sunshine, and soon were in the presence of a lofty precipice 500 feet high forming the end of an amphitheatre to the north, and extending thence down the valley as far as the eye could reach.

The top of the cliff is well wooded, the timber and herbage concealing the lava cap, which in places protects and covers this mighty body of gravel and pebbles. The face of the cliff is beautifully sculptured, channelled, and fluted, like sculptured and channelled "potato hills" of the celebrated "bad lands" of Dakota. Though the general color of the cliff of detritus is an ashen or greyish white, there are shades and bands of color at intervals that add much to its picturesqueness. Thus the upper portion has a reddish tinge from iron oxide, the middle is almost a chalk white from a thick belt of pipeclay, and the lower section has a leaden gray and somewhat sombre and rough appearance from containing the coarser and larger boulders of all sorts of rock but principally of dark volcanic varieties. This lower section showed among its boulders frequent irregular splashes, belts and lenticular bands of finer gravel, cross bedded and evidencing the strong currents and rapidly moving water by which these boulders and sand were deposited. This terminated at the base of the cliff on bedrock schist, immediately above which the main hydraulic work has been done, and down into which deep trenches 30 to 50 feet deep have been cut into the schist bedrock to accommodate the down grade of the flumes for carrying off the dirt, gold, and boulders thrown down by the giant nozzles. These trenches had wooden flumes 5 feet wide by

3 feet deep at the bottom paved with riffles of squared pine blocks from 13 to 22 inches in diameter. Broken sections of great wide mouthed water pipes, 22 to 27 inches in diameter, lay scattered around. These formerly led up to the reservoirs, 22 miles distant, covering 500 acres, and connected with the great Yuba ditch 40 miles distant. Here and there forlorn looking monitors pointed their cannonlike nozzles impotently at the great banks of debris, reminding one of a fort that has been abandoned, and its guns spiked and left to rack and ruin.

Towards the entrance of the amphitheatre, leading out to a wide basinlike expanse, at its narrowest point, a dam of brush, stones, and trees fifty feet high is thrown across the ravine, and across the path of the main ditch flume, leaning upon this at a steep angle of 45°, was the hydraulic elevator, a wide open half section of a great metallic pipe, four feet wide by 28 inches deep; at the bottom of this in the flume two giant nozzles, one on either side of the elevator, hurled aloft sand and rocks as they came rattling down the flume to a height of over 100 feet, descending in the basin beyond in a deluge of water, mud, and boulders, thus disposing of the debris, which otherwise would soon have choked up the workings. Underneath the dam and along the length of the basin beyond is a tunnel or waterway, carrying out the imprisoned water to a discharging point some distance down the ravine. Cofferdams are located at convenient points along the line of this tunnel. The elevator was of enormous force, and would hurl aloft, like a baseball, any rock that was big enough to fill its ample trough.

Near here was formerly the location of the celebrated Malakoff and Derbec mines; the latter was a drift gravel mine, but lately closed down. The mine was worked to a depth of 500 feet through a vertical shaft and the gravel was about 11 feet at the bottom. This not being cemented was washed down in sluices and yielded an average of \$2.47 per ton. This was the average for twelve years. About 200 tons were extracted daily. The channel has been worked a distance of 4,000 feet in a straight line from the shaft. Over \$50,000 was spent before gravel in paying quantities was found. The mine has produced over \$3,000,000 all told. The Malakoff was worked by the hydraulic process, being one of the largest hydraulic mines in the world. The elevator process was used to retain the debris. Over \$3,000,000 were spent before it became a paying property, but it has since produced over \$5,000,000. It is estimated that there still remains in the channel \$35,000,000 yet to be extracted.

The North Bloomfield hydraulic mine is situated three-quarters of a mile southwest of the town of North Bloomfield. It is said to have been the largest hydraulic mine in the world, being a consolidation of many claims, aggregating 1,535 acres. One-fourth consists of gold-bearing gravel resting on an ancient river-channel; 11,000 feet of tunnels have been driven. Its water plant cost over \$1,000,000, and is next in size to the plant of the South Yuba Water and Canal Co. Bowman's dam was built in 1872, and this, with other dams, will hold 450,000 miners' inches of water. The main ditch is 55 miles long and has a capacity of 3,200 miners' inches. The pay channel is 400 feet wide, and the "blue gravel" 135 feet deep. Before the mine was closed down by litigation 150 to 200 men were employed. The mine has produced \$6,000,000 and is capable, it is said, of producing \$1,000,000 per annum when in full

operation. At present only one small mine is at work drifting on one of the main channels.

The North Bloomfield gravel mine was not working at the time of our visit, but the following account from the mining bureau report will give an idea of how it was in 1894.

"Forty men are employed on a limited area, having complied with the requirements of the law as to impounding debris, it being elevated 60 feet and deposited in a portion of the old hydraulic pit and retained therein by means of brush dams until the slimes have settled when the water is passed through a shaft into the main outlet tunnel and dropped into the river. At present one monitor with a 6-inch nozzle taking water under 500 feet pressure is operating on a bank over 300 feet high, with 140 feet of solid gravel next to slate bedrock. At the point of operation the bedrock was wearing away, showing the presence of either a deeper basin or another channel behind. About 1,500 feet of 5-foot sluices lined with 13-inch pine blocks, costing 11 cents per foot are used in washing the gravels. After passing through the sluices the waste material drops into an open elevator box up which it is thrust by the water issuing from two 4½-inch nozzles, under a pressure of 500 feet. The bottom is lined with 3-inch plates of manganese steel costing 8 cents a pound, which withstands the friction of the rocks far better than the white iron plates formerly used. The Giant works during the night shift. The day shift pick the ground and break up the pipe clay and gravel.

"A deep cut in the bedrock is carried up to the face of the present bank to enable the bottoming of the deeper portion of the channel. The output is 2 cubic yards per miners' inch. A clean up is made twice monthly; the gold is worth \$18 per ounce."

In working these cliffs of consolidated boulders and gravels great care has to be used when undercutting with the nozzles at "bedrock" not to bring the great nozzles too near the embankment, the upper part of the cliff being liable to cave in without warning and to fall. The north end of the amphitheatre illustrates this, for a quarter of a mile or more back, the amphitheatre is filled with a great landslide of rocks, trees, and blocks of ground and debris jumbled together, representing millions of tons of fallen matter.

Among the curiosities of this river-drift gravel, is the presence of beds of lignite and of stumps of carbonized and petrified trees, accumulated doubtless as driftwood. While the whole cliff, from top to bottom, carries a certain per cent. of gold, the coarse blue boulder gravel for about 100 feet thickness above bedrock is mainly worked, and has produced the most gold. The bed of pipeclay in the middle of the cliff is the most barren, and is a hindrance from its tendency to clog the sluices. Though millions upon millions of gold were taken from these deposits in former days but few nuggets of any size were found, the gold being, as a rule, only moderately coarse.

Taking it all in all, the scene as we stood in that great amphitheatre, surrounded by its ghastly cliffs, with the relics strewn around of a once vigorous industry, was a gloomy and depressing one, and we gladly turned away for more active and cheerful surroundings.

These we found in the adjacent Placer county where there are excellent examples of active drift mining in hard cemented and lava-capped placers in the Forrest Hill region.

## Dividends Paid by Mexican Mines.

The following table of dividends paid by mines in the Republic of Mexico in 1898, is taken from *El Minero Mexicano*:

NAME OF MINE.	Number of Shares.	Amt. of Divid. per Share.	Total Paid.
Cia. Minera Peñoles, Durango	2,500	\$240	\$1,050,000
Sta. Maria de la Paz Matehuala	2,400	400	960,000
Cia. Minera Angustias, Pozos	2,400	185	444,000
Alacran y Anexas, Zacualpan	2,400	180	432,000
Esparanza y Anexas, El Oro	3,000	140	420,000
Hda. Benef. Guadalupe, Pachuca	10,000	32	320,000
El Triangulo, Pozos	2,500	72.50	181,250
Cia. Real del Monte y Pachuca, id.	2,554	70	178,780
Sta. Gertrudis y Anexas, aviador, Pachuca	28,800	6	172,800
Hda. Benef. S. Franc., Pachuca	6,000	24	144,000
Idem de la Luz, Pachuca	3,750	30	112,500
S Rafael y Anexas, aviador, Pachuca	1,200	92	110,400
Hda. Benef. La Union, Pachuca	3,000	32	96,000
San Rafael, aviador, Pachuca	1,200	72	86,400
Amistad y Concordia, Pachuca	12,000	6.20	79,360
Cia. Transmision Electrica de Potencia, Pachuca	7,000	10	70,000
Cia. Min. Sta. Fe, Matehuala	2,500	30	75,000
Nuevo Porvenir, Zacatecas	2,400	20	48,000
Nueva Quebradilla, aviador, Zacatecas	2,400	18	43,200
Cinco Senores, Pozos	2,400	15	36,000
Sta. Anita Mining Co., Huautla	4,000	9	36,000
Hda. Benef. Bartolome Medina, Pachuca	2,000	15	30,000
Cia. Benef. San Luis, San Luis de la Paz	3,000	8	24,000
Guadalupe Fresnillo, Pachuca	2,400	10	24,000
San Felipe de Jesus, aviador, Pachuca	3,600	4	14,400
Sorpesa, aviador, Pachuca	960	15	15,000
Soledad, aviador, Pachuca	960	10	9,600
Hda. Benef. Purisima Grande, Pachuca	1,000	5	5,000
Idem San Agustin, Guanajuato	1,000	5	5,000
Sta. Gertrudis, aviador, Pachuca	9,600	0.20	1,920
Total in 1898			\$5,224,070
Total in 1897			\$5,079,100

This only includes the mines quoted on the mining Exchange in Mexico. There are many others which have paid well but of which there are no public records.

Several of the largest smelters throughout the country are reported about to consolidate with a \$50,000,000 capitalization. It is understood that as between the combine and the smelting establishments not included therein, existing arrangements regarding interchange of business, etc., will not be disturbed. Among those specified as being about to enter the combination none west of Utah are so far mentioned.

The total production of the Mexican silver mines for 1898 is calculated at a value of \$57,000,000. This was 35 per cent of all the silver produced on the world last year, and four millions in excess of the amount produced by the United States. To show the great increase in silver mining in the republic it may be said that the total product of all the Mexican mines in the year 1878, or twenty years ago, was only a little in excess of \$8,000,000.

One of the most important surveys made in Mexico for some time was just begun under the direction of the National School of Mines. The survey will be made entirely across the republic, in as straight a line as possible, from Vera Cruz on the Gulf coast to Acapulco on the Pacific.

The object of the work is to secure complete and correct data as to the geological

formations of the country between the two coasts. The mineral veins discovered along the line of survey will be examined and developed sufficiently to determine their nature, and, in some measure, their extent. The information gained on this subject will be of general interest, and quite momentous.

One surveying expedition has already started from Vera Cruz and will be eventually met by another one, which will start from Acapulco within the next three or four weeks. Both expeditions will have a corps of skilled geology.—*The (Mexico) Trader*.

The Mexican Government appreciates the value and importance of her mineral wealth, and sets a good example to the United States, in regard to energy.

## PERSONAL NEWS ITEMS

S. J. SMITH, the genial agent for the Lambert gasoline and distillate engine, also the Fulton power pump, has erected a pumping plant for J. T. IRWIN of Irwindale, Los Angeles county, Cal. It is composed of a 25-H. P., No. 3 Variable Motion Fulton pump, driven by a Lambert Engine. Work performed by the plant is excellent. Forty inches of water is lifted 195 feet. Everything about the plant is first class and speaks well for the machinery handled by Mr. Smith.

PROF. HERMAN REINHOLD, of Omaha, is in Custer, South Dakota, looking after his mining interests.

JOHN LEACHMAN of San Francisco, Cal., has gone to New Mexico to open up some gold mines near Lordsburg.

SUMMERY O. L. SPARKERS of Cherokee Co., Kansas, has lately let the contract for the erection of a 125-ton mill to be placed on the East Galena ground, at Galena, Mo.

DON ANTONIO PENAPIRI, and CIVIL ENGINEER (PENAPIRI) of the geological institute of the State of Hidalgo, Mexico, have been making an investigation of some rocks discovered at Irolo Hidalgo, which appear to contain fossilized human remains.

STRONACH & GEORGE of Spokane, Wash., have bought the Paragon claim on Pitchard creek, a little east of Murray, Idaho, it is reported, for \$64,000 cash.

J. CARMICHAEL has sold his quarter interest of the Naunkah mine at Joplin, Mo., to J. J. MANNION of Galena, for \$1,500.

DON JUAN CRUEL, the agent for the Compania Industrial Mexicana, the mining machinery house of Chihuahua, has recently returned home from a trip through the mining districts of Chihuahua, Mexico.

F. M. THOMAS contemplates putting up a mill at Pike City, Sierra County, Cal.

CAPT. JOHNSON, of Orange, Va., has purchased the Powhatan mine in Culpepper Co., Va., for a reported price of \$40,000 and expects to begin working the mine soon.

C. H. UNVERZAGT, president of the United States Negro Co., of Brittimore, Md., was a visitor at the U. S. mint office the other day.

W. P. CUNNINGHAM, representing the Lewis Co., miners of Mexico, reports mining prosperous in Parral, Chihuahua, Mexico.

JUDGE W. B. WALLACE of Visalia, Cal., has lately bought D. R. BULLARD's interest in the Gravel Hill Hydraulic mine, in Nevada Co., Cal.

F. W. WALKER, engineer, at the Detroit & Deadwood shaft, in Two Bit District, South Dakota, has gone to Michigan to accept a proposition of chief engineer in a beet sugar factory.

G. P. MACKEY, the mining man from Parral, Chihuahua, Mexico, has recently purchased the machinery from the Mina del Agua and will remove it to Santa Barbara in the State of Chihuahua, where he will operate it as a custom mill.

The old Escondido mines near Acton have been purchased by Dr. G. P. GEHRING, a Los Angeles mining man.

GRO. H. LUPER of Deadwood, S. D., has gone to Denver, Colorado on business. He will visit Philadelphia before returning to Deadwood.

MESSRS. J. W. EVERT and H. W. ALEXANDER are stopping in the City of Mexico, Mexico, prior to going to Puebla, where they are erecting the DeMier water power plant, for the Western Electric Co., of Chicago, which is to supply Puebla with light and power.

JOHN G. STEPHENS, a miner in the employ of the Yellow Aster Co. at Randsburg, fell from a ladder a few days ago and was seriously injured.

JOHN S. GEORGE of Milwaukee, who was in Deadwood, South Dakota, for several days attending to a case in the U. S. court in which he and E. W. SPERD of Omaha are interested, has gone to Keystone, S. D., on a matter of business.

HENRY HANSON of Minas Prietas, has recently sold to MRS. J. D. FRESH and JAMES PRINMAN the Aviachi mine in the Sabinalpa district, Mexico.

C. J. BERRY, the successful Klondyker, with several others, are in Bakersfield negotiating for the lease of the Asphaltum Asphaltum beds.

C. C. DRAN, formerly of the Los Angeles Assay Office and Mining Exchange, has sold his office in Los Angeles and gone to the city of Chihuahua, Mexico, to engage in some business.

J. R. AMBROSUS, a prominent mining man of Parral, Chihuahua, Mexico, has recently returned from a business trip to the City of Mexico.

F. M. MINES, superintendent of the Valparaiso mine near Tuttletown, Cal., has lately left for Chicago, as the company he represents have given up their lease to the mine.

R. M. MALONEY of Deadwood, South Dakota, has lately closed a deal for the five claims west of the Holy Terror.

## THE MARKETS.

All quotations, financial reports and other statistical figures given under this head are New York Quotations, unless otherwise stated in each item. These figures are carefully revised each issue, and constitute a very accurate compilation of statistical matter.

NEW YORK, Jan. 30th, 1899.

The following are the Silver, Copper and Lead quotations for the last two weeks:

	SILVER.	COPPER.	LEAD.
Feb. 1	... 200	17 75	4 25
10 ...	205 1/2	17 75	4 50
17 ...	205 1/2	17 75	4 50
18 ...	205 1/2	17 75	4 50
20 ...	205 1/2	17 75	4 15
21 ...	205 1/2	17 75	4 12 1/2
22 ...	... 205	17 75	4 10
24 ...	205 1/2	17 75	4 10
25 ...	205 1/2	17 75	4 10
27 ...	205 1/2	18 00	4 25
28 ...	205 1/2	18 00	4 25

## SILVER.

The silver market has been quiet, with business done at slightly declining rates. It is to be noted, however, that the rates for spot and future have been converging so that March silver has commanded a price only a little under metal for prompt shipment!

## COPPER.

The unusual demand for copper is causing comment all over the world. The latter part of last month the quotations were \$12.50 while today they have reached the remarkable figure of \$16.25. Buyers held off as long as possible and have utilized the stock on hand and are now forced to buy to supply their needs, thereby causing the market to be bulled; and as a matter of consequence the price has gone up. We quote for Lake, \$16.00 @ \$16.25; electrolytic in cakes, wirebars

and ingots, \$15.75 @ \$15.87 1/2; cathodes \$15.75, with casting copper at 15.87 1/2 @ \$16.00.

## LEAD.

A steady increase in the demand for lead has raised the price to \$4.35 with a prospect of it going some higher. There have been considerable quantities of lead withheld from the market with the expectation of securing higher prices, and undoubtedly this will be thrown open, which will cause a reaction and fall in price.

We have to quote \$4.27 1/2 @ \$4.35 New York, and \$4.20 @ \$4.25 for St. Louis.

## SPLINTER.

The demand continues fairly steady but is no longer as brisk as it was during the few preceding months. There is quite a disposition on the part of sellers to meet the demand, the quotation being 5.0 1/2 @ \$5.10c at St. Louis and 5.20 @ \$5.25c at New York.

## ANTIMONY.

Antimony continues strong, and we quote Cookson's 93% @ Hallett's, U. S. Star and Japanese, 93%.

## NICKEL.

Business still continues on unchanged lines and no alteration in prices can be reported. We quote for New York ton lots 33 1/2c, and 36c per lb and for smaller orders 35 1/2c, and 38c.

## TIN.

Although the London cables reported a serious break at the beginning of the week, prices here have remained fairly steady on account of supplies being rather meagre. We quote the metal at 18 1/2c, or 18.25c.

## PLATINUM.

Prices are now quoted at \$16 and \$16 per oz., New York. The London quotations are 59 @ 60s per oz. Supplies are not large and prices are firm. Porcelain ware, best hammered metal. In lots,

of 250 grams or more, 56c, per gram; in lots of 100 grams or more, 57c, per gram; less than 100 grams, 58c, per gram; unmanufactured platinum will be supplied in same quantities at 2c. less per gram.

## POTASSIUM CYANIDE.

Purified, 98@99 per cent., in cases of 120 lb., at 32c. per lb. in 5, 10, 25 and 50 lb. tins at an advance.

## QUICKSILVER.

The New York quotations are unchanged at \$39.50. The London price is also unchanged at 7 lb. 6s. per flask, with 7 lb. 4s. named for second ends.

## POWDER.

F. o. b., San Francisco: No. 1, 70 per cent, nitro-glycerine per lb., in carload lots, 17 1/2c; less than one ton, 17 1/4c. No. 1\* 60 per cent., carload lots, 13 1/2c; less than one ton, 15 1/2c. No. 1\*\* 50 percent, carload lots, 11 1/2c; less than one ton, 13 1/4c. No. 2, 40 per cent., carload lots, 10c; less than one ton, 12c. No. 2\*, 35 per cent., carload lots, 9 1/2c; less than one ton, 11 1/2c. No. 2\*\* 30 percent., carload lots, 9c; less than one ton, 11c. Black blasting powder in carload lots, minimum car, 728 kegs, \$1.50 per keg; less car lots, \$2 per keg.

## COKE.

The trade in coke at St. Louis is reported very quiet—a condition not unusual as the year draws to a close.

## IN CAR LOTS, ST. LOUIS.

Connellsville fdg coke 72-hr. frv. \$4.85  
New River \$1.00 Pocahontas .190  
Crusht .185  
Gas works coke, lump, per bushel .10

## BORAX.

The San Francisco market in Borax is firm with a good demand.

The market is quoted as follows

Refined, in carload lots, in barrels .75
Refined, in carload lots in sacks .75
Powdered, in car lots .75
Concentrated, in car lots .65

## THE MINOR METALS.

Quotations are given below for New York delivery.

## ALUMINUM.

No. 1 50 per cent. Ingots, per lb. .150@.160
No. 2, 50 per cent. Ingots, per lb. .110@.120
Roiled sheets, per lb. .110@.120
Aluminum—Nickel, per lb. .130@.140
Phosphorus, per lb. .140@.150
Tungsten, per lb. .160@.170
Tungsten-titanium, 50 per cent. .160@.170

Variations in price depend chiefly on the size of the order.

## CHEMICALS

Deliveries on contract are good. New contracts have been taken, particularly for alkali. Much 1898 business has been done in domestic caustic soda, prices ranging from \$1.30 f. o. b. works to the contract price.

## CAUSTIC SODA

Quotations for Caustic soda domestic high test are \$1.40 @ 1.45 per hundred lbs.

## ALKALI.

Domestic, 58 percent., 50c. @ 55c., foreign 56c. @ 60c. from dock as to style of package.

## CARBONATED SODA ASH

.58 per cent., 90c. and 95c. per 100 lbs. basis 48 per cent.

## M-CARBONATE OF SODA.

English, \$2.12 1/2 @ \$2.25 per 100 lbs. American, bulk \$1.25 and \$1.50 per 100 lbs. according to brand.

## SAL-SODA.

For domestic, 50c. per 100 lb., less usual discounts; English, 65c. @ 67 1/2c. Concentrated sal-soda, \$1.60 @ \$1.65 per 100 lbs.

## CHLORATE OF POTASH.

Chlorate of potash is quoted at \$9.50 and \$9.75 per 100 lbs.

## BELTS WILL SLIP - BUT

## CLING-SURFACE

WILL STOP IT PERMANENTLY.

CLING-SURFACE is to be applied to the inside of a belt.

It has been so universally satisfactory for the past three years that we can safely guarantee that its use will not only stop all slipping, but that the belts will become soft and pliable, yet firm; if of leather, they will become as soft as calf skin, and also absolutely water-proof; and furthermore we guarantee that the belts can be run slack, and that the power will be increased so much that in a fair-sized plant the cost of the sample can will be earned monthly.

This applies to all belts, leather, cotton, rubber or a rope drive, whether new, old, or oily. We will send you a sample can for trial; or, if you prefer, we will advise you further as to its nature.

CLING-SURFACE MFG. CO., 167-172 VIRGINIA ST., BUFFALO, N. Y.

REPRESENTED IN SALT LAKE BY THE UTAH RUBBER & MFG. CO.

## A Practical Test ...

We asked a man the other day what he thought of our pumps.

"Well," said he, "I've used this pump for twenty years, and it's better than most pumps yet."

The best material, workmanship and patented construction—that's why our pumps wear.

Are you going to buy—Write us for full information and catalogue. All free for the asking.

W. T. GARRATT & CO.,  
Pump, Bell, Brass and Machine Works,  
138-142 Fremont St., San Francisco, Cal.

## MINERALS WANTED +



Gold and Silver Quartz Specimens, Crystals, Opals, Turquoise, etc., etc.

Buy in Any Quantities - Pay good prices—Cash

E. C. MOLLER,

538 EAST 86TH STREET,

NEW YORK

## The Pulsometer Steam Pump

"THE MINER'S FRIEND"

Often Imitated—Never Equalled

Over 20,000 in Use

## RECENT IMPORTANT IMPROVEMENTS

The Handiest, Simplest and Most Efficient Steam Pump for General Mining, Quarrying, Railroad, Irrigation, Draining, Coal Washing, Tank-Filling and for Pumping back Liquids heavily impregnated with sediment. Muddy or gritty liquids handled without injury to the Pump.

## AGENTS

PARK & LACY CO., A. M. HOLTER HDW. CO., MITCHELL-Lewis & STAYER CO.  
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CATALOGUE ON APPLICATION  
CORRESPONDENCE SOLICITED

Pulsometer Steam Pump Co.

130 Greenwich Street, New York City

# THE MINING AND METALLURGICAL JOURNAL

## CHLORIDE OF LIME.

English prime brands \$1.60@\$1.70; American, \$1.70@\$1.80; Continental F., \$1.60@\$1.60 per 100 lbs.

## ACIDS.

Spot business is only fair, while for future delivery a few more contracts have been booked. Oxalic acid has been reduced by the syndicate to 6½¢; thus the jobbers who have bought heavily at 8½¢ are now in a predicament.

Quotations are per 100 lbs from New York and vicinity as follows: Acetic acid, commercial, No. 8, \$1.40@\$1.50; muriatic acid, 18°, \$1.10@\$1.75; 20°, \$1.20@\$1.87½; 22°, \$1.35@\$2.25, according to quantity and brand. Nitric acid 36°, \$3.50@\$4.75; 38°, \$3.75@\$4.62½; 40°, \$4.40@\$4.87½; 42°, \$4.62½@\$5.25. Oxalic acid, \$6.50@\$6.75. Mixed acids, according to mixture. Sulfuric acid, 66°, \$1.10 for drums and \$1.15@\$1.75 for barrels. Chamber acid 50°, in jobbing way, \$11.50@\$12 per ton f. o. b. factory. Blue vitriol \$8.50@\$3.62½ for extra grades and \$3.37½ for ordinary.

## BRIMSTONE.

The market has closed off on the arrival of 2,400 tons, and spot best unmixed seconds can doubtless be had at \$21 per ton, while futures are obtainable at \$19.50@\$20 per ton. Thirds are nominal at \$18.50@\$20. The shipments of brimstone from Sicily to the United States in November, were 7,300 tons.

## NITRATE OF SODA.

Buyers and sellers of nitrate of soda are still to far apart to come to any large sales, though about 5,000 bags were sold recently at \$1.52½ per 100 lbs. Sellers are quoting up to \$1.55 for spot, and for futures extending through December, 1899, \$1.55 to \$1.57½ per 100 lbs.

## FINANCIAL NOTES.

### Average Prices of Metals

in New York per pound from January 1, 1898:

Month	Copper	Tin	Lead	Spelter
January	10.99	13.87	8.65	8.62
February	11.03	13.85	8.71	8.63
March	11.05	13.8	8.7	8.67
April	11.11	13.6	8.73	8.69
May	11.12	13.62	8.74	8.7
June	11.06	13.52	8.72	8.72
July	11.03	13.6	8.7	8.7
August	11.09	13.74	8.73	8.73
September	11.0	13.7	8.7	8.7
October	11.03	13.77	8.78	8.78
November	11.06	13.78	8.79	8.79
December	11.1	13.7	8.76	8.76
Average	11.06	13.7	8.75	8.75

### Average Monthly Prices of Silver.

In New York per ounce Troy, from January 1st, 1899, and for the years 1898 and 1897:

Month	1898	1897	1896
January	\$.90	\$.87	\$.84
February	\$.86	\$.87	\$.84
March	—	\$.87	\$.87
April	—	\$.87	\$.86
May	—	\$.87	\$.87
June	—	\$.87	\$.87
July	—	\$.87	\$.87
August	—	\$.87	\$.87
September	—	\$.87	\$.87
October	—	\$.87	\$.87
November	—	\$.87	\$.87
December	—	\$.87	\$.87
Year ...	\$.87	\$.87	\$.87

The statement of the United States Treasury, on Thursday, Feb. 16th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	Feb. 16.	Changes,
Gold.....	\$227,551,454	D. \$164,548
Silver.....	15,369,555	D. 987,123
Legal Tenders, etc.	1,587,127	I. 24,995
Total... .	1951,37,922	D. 3,511,14

Treasury deposits with national banks amounted to \$87,299,096, a decrease of \$261,589 during this week.

## The Cleveland Mining and Stock Exchange Co.

New England Building, Cleveland, Ohio.

A Reliable Information Bureau for Miners and Investors to obtain FACTS Regarding Capital and Mines. Stocks and Mines listed. Send for prospectus

## Morgan-Watson Mining and Construction Co.

809-Rio New England Building, Cleveland, Ohio

**MINES AND STOCKS** { We Buy, Sell, Lease and Bond Mines of all kinds.  
We Buy, Sell, and Negotiate sales of mining and other stocks.  
We Furnish Machinery to work good mines under special arrangement.  
We Furnish Capital to develop mines.

## JAMES IRVING & CO. REFINERS ASSAYERS



Mint Prices paid for Gold and Silver Bullion. Returns made within four hours after receipt.

Largest and most complete establishment in Southern California. Cyanide and Mill Test.

128 N. Main Street (Old Location) Los Angeles, Cal.

ALL THE MINING CAMPS OF UTAH AND COLORADO ARE LOCATED ON OR REACHED BY

## The Rio Grande Western Ry.

THE SHORTEST, QUICKEST AND MOST DIRECT ROUTE TO

## MERCUR AND CRIPPLE CREEK

### MERCUR:

The Johannesburg of America, New and Wonderful Camp only 45 miles from Salt Lake City, Utah.

### CRIPPLE CREEK:

The Greatest Gold Camp in the World, only six years old and two hundred shipping mines in the district.

P. A. WADLBICH,

GENERAL PASSENGER AGENT,

Salt Lake City, Utah

## THE MINING AND METALLURGICAL JOURNAL

### Gold and Silver Exports and Imports.

At all United States ports, October 1898, and year from January 1st, 1898 and 1897:

	OCTOBER,	+/By
Gold - Exports.....	\$10,311,311	\$1,279,016
Imports.....	14,275,073	16,121,358
Excess.....	1,181,462,172	1,14,047,432
Silver - Exports.....	\$6,225,437	\$4,572,827
Imports.....	3,184,433	2,137,707
Excess.....	1,152,014	\$1,080,030
Gold - Exports.....	1897	1898
Imports.....	\$32,929,509	\$14,001,849
Excess.....	28,356,319	14,088,005
Silver - Exports.....	1,419,574	1,389,396,246
Imports.....	27,154,680	21,974,164

A very valuable extension Lead Mining Property in Southwest Virginia. It is sunk over 200 feet and actual work has demonstrated richness of veins and purity of ore. Address: OREGON FRANKE,

### OPPORTUNITY.

GOLD, COPPER AND IRON MINING is profitable and respectable when you have the right area to mine. Because we propose to lease one or more salinable mines in those terms call or write.

VAN ANDA COPPER & GOLD COMPANY,  
Inns of Court Building, Vancouver, B.C.  
Van Andra City, Texada Island, B.C.  
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### WANTS

Advertisements of this class containing not more than five lines will be inserted for not exceeding three months in any year, free of charge, to all paid-up annual subscribers.

Other than above \$1.00 per month.

Advertisements not accepted for less than one month.

EXPERIENCED Assayer and Cyanide operator desires engagement. The successful and economical treatment of silty ore or tailings by cyanide a specialty.

ADDRESS W. V. WATSON,  
By, White Pine Co., Nev.

GOLD mine anywhere in United States, must have at least 1000 feet of development; where coal is not over \$6.00 per ton or wood \$4.00 per cord delivered; plenty of water; no objection to low grade ore if profit can be made by having large plant to amalgamate and concentrate; want 6 months working bond; no property considered unless owners are prepared to deposit certified check to be forfeited for expenses of engineer if property is not as represented. Address with price and full particulars.

J. E. M., Journal Office,  
150 Nassau Street, New York, N. Y.

### FOR SALE!

TWO-THIRDS interest in well developed gold mine in Dona Ana County, N. M. See Ad page 21.

TRINIDAD Two Stamp Steam Mill at Tucson, Arizona 15-14 P. Boiler Pump and everything complete, set up ready for work. In excellent condition, used less than six months.

Address DREDGING MINING MACHINERY CO., Kinnakee City, Mo.

### FOR SALE AT A BARGAIN.

A 60-TON copper Smelting Plant, consisting of two 30 ton furnaces, one of which has new seamless liner. Plant is complete in every detail. Also an 8-ton Silver-Lead Furnace, entirely new, never having been set up. All of the above located immediately adjacent to railroad. Enquire of GARDNER, WORTHER & CO., dealers in Mining and Mill Supplies, Tucson, A. T.

### ANTIMONY BISMUTH

PROSPECTORS having locations of this nature and wishing to sell notice cash, will do well to address with full particulars.

P. O. Box 708  
SAN FRANCISCO, CAL.

TELEPHONE 582

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Agent for Rubber Belting, Hose and Packing.

105 and 107 Mission Street,  
San Francisco, Cal.

## John Wigmore & Sons Co.

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### Mine and Mill Supplies, Iron and Steel

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LOS ANGELES, CAL.



### LARGEST GASOLINE PUMPING PLANT IN THE WORLD

The illustration shows the gigantic pumping plant recently built by the Hercules Gas Engine Works on the Packer Ranch, Coloma Co. 80 h. p. Hercules Engine, pumping 7200 gallons a minute, 27 feet high. Burns Gasoline or Distillate oil. Cheapest power known. Gas, Gasoline and Oil Engines, 2 to 800 h. p. Send for Catalogue. HERCULES GAS ENGINE WORKS, 218 Bay St., San Francisco.

## MINING STOCK QUOTATIONS

## BOSTON

Adventure	15 50	Isle Royale	60 50
Allouez	12 50	Kidder	8 00
Arcadian	75 50	Mohawk	8 00
Atlantic	11 50	New Quicksilver	8 00
Banana	42 50	Old Colony Min	20 25
Banana	17 74	Old Dominion	47 00
Boston & Mont	14 00	Oscollo	103 75
Breeze	2 00	Parrott	47 50
Butte & Boston	82 50	Pioneer	4 00
Calmet & Hecla	80 00	Quincy	184 00
Catalpa	55	Rhode Island	11 87 5
Centennial	80 00	Tamrakk	246 00
Cochiti	15 50	Tecumseh	6 75
Crescent	25	Victor	5 50
Dominion	118 50	Utah Mining	45 00
Franklin	28	Washington Ming	4 00
Gold Dredging	42 50	Winnona	20 00
Humboldt	3 50	Wolverine	48 75

## ROSSLAND, BRITISH COLUMBIA

Alecto	10	Le Ro	7 50
Big Three	15	Lilly May	19 50
Butte	24	Mayflower	0 50
Caledonia Con	85	Monte Christo	14 00
Colonna	28	Mornig Star	0 50
Deolder	12	Phoenix	0 50
Deer Park	18	Plowman	0 50
Enterprise	18	Nest Egg	0 50
Kurk's Con	65	Northern Belle	0 50
Evesing Star	5 50	Novelty	0 50
Georgia	0 50	Palo Alto	0 50
Gratitudo	12	Phoenix	0 50
Good Hope	0 50	Powerman	12 50
Grand Prize	0 50	Red Mount, View	0 50
Great Western	80 50	Roseland, Red Mt.	16 50
Hattie Brown	0 50	Anchor	0 50
High Ore	0 50	Silverside	0 50
Iron Monk	78	Silver Bell	0 50
Iron Colt	10	S. Elmira	0 50
Jesse L.	10	Victoria	0 50
Jodie	39	War Eagle Con	2 00
Josie Mac	65	West Le Ro	28
Jumbo	47	White Bear	0 50

## SAN FRANCISCO

Alce	75	Joe Bowers	27 50
Ajax	80	Little Pittsburg	16 50
Alliance	30	Lower Mammouth	78 50
Anchor	50	Mammouth	2 00
Buckeye	0 50	Mercur	7 00
Bullion Beck	5 25	Northern Light	49
Cent. Kureka	30	Omaha	58 50
Chloride Point	1 38	Ontario	8 20
Daisy	64	Overland	2 00
Dalton	0 50	Richmond Ans.	0 50
Dalton & Lark	0 50	cond	0 50
Daly	0 50	Sacramento	52 50
Daly West	45	Silver King	30 00
Dexter	3 15	Star Consolidated	1 37 5
Eagle	0 50	Sunbeam	12
Eagle & Blue Bell	1	Sunshine	4 25
Four Aces	48	Swanson	3 67 5
Galeena	50	Swanson	1 28
Geyer-Marion	90	Tetro	13
Golden Eagle	0 50	Utah	95
Grand Central	8 00	Valeo	1 40
Homestake	0 50	West Mtn Placer	87 50
Horn Silver	1 16	Young America	60

## NEW YORK

Adams Con	0 50	Japan	6 00
Alamo	0 50	Jefferson	0 00
Alta	0 50	Julia Consol.	0 50
American Gold	0 50	Juanita	0 50
Anaconda Gold	0 50	King & Pemb	10
Brace	0 50	Lacrosse	14
Breast	0 50	Lagonda	40
Bronswick	0 50	Latin Chief	17
Cannon Ball	0 50	McLean	40
Chowan	0 50	Mollie Gibson	25
Chrysoltite	0 50	Mr. Ross	20
Comstock Tunnel	0 50	Occidental	0 50
Comstock Stocka	0 50	Old Gold	0 00
Comstock Script	0 50	Ontario	0 50
Consolidated Imp	0 50	Ophry	0 50
Con Cal & Va.	0 50	Pharmacist	0 50
Conestoga	0 50	Pilgrim	0 50
Crescent	0 50	Plymouth	10
Creston	0 50	Portland	0 50
Crown Point	0 50	Potosi	0 50
Cupri Creek Con	0 50	Quicksilver	0 50
Diamond	0 50	Rocky Mountain	18
Enterprise	0 50	Savage	18
Father de Smet	0 50	Sentinel	0 50
Garfield Con.	0 50	Silesia Nevada	15
Gold Magnet	0 50	Small Hope	26
Golden Fleece	0 50	Standard	20
Gould & Curry	0 50	Union Con	10
Hale & Norcross	0 50	Union	12
Homestake	0 50	Utah Con	12
Horn Silver	0 50	Waldorf	0 50
Jambella	0 50	Work	28
Iron Silver	0 50	Yellow Jacket	22

## ORE TESTING

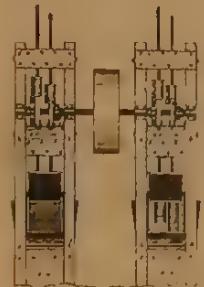
Complete mill for testing ores on practical scale by all processes to determine the best process adapted to treating any ore submitted. Processes in use investigated to overcome unnecessary losses, etc.

## RICKETTS &amp; BANKS.

Metallurgists &amp; Chemists

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## Krogh Manufacturing Company

Successor to San Francisco Tool Co.'s Machine &amp; Milling Dept.

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Krogh 2-Stamp Triple-Discharge Quartz Mill, of Latest Improved pattern, Rock Breakers, Ore Feeders, Concentrators, Kinglins and Bolters, Hoisting Rigs to be operated by Horse, Steam Power or any other motor; Ore Cars and Ore Buckets, Cornish and Jack-head Pumps, Triple-acting Pumps, Centrifugal Sand and Gravel Pumps, Wooden Tanks and Pumps for the Cyanide Process, Pipe and Gate Valves, Link Chain Elevators for elevating and conveying all kinds of material. Estimates as to cost of machinery and its erection furnished upon application. Write for Catalogue and Prices.

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Barometers, Thermometers, Field Glasses, Microscopes and Accessories. Repairing Promptly Done.

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The Southern California Lumber Co., Stimson Bldg., Los Angeles, Cal., Chas. Wier Manager, sells

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Write for Prices

## FROM CRIPPLE CREEK

AIR COMPRESSORS,  
ROCK DRILLS,  
Stone Channelers,  
The Pohle Air Lift Pump,  
Coal Cutters,

THE INGERSOLL-SERGEANT DRILL COMPANY, HAVEMEYER BUILD'G  
PARKE & LACY CO., AGENTS, SAN FRANCISCO, CAL.

New Catalogue No. 32

New Catalogue No. 41

Pamphlet No. 100

Catalogue No. 72

Special.

JAMES T. BURNS, Pres't, FRANK O. BICK, Sec'y and Treas.

THE PORTLAND GOLD MINING CO., Stock Transfer Office, Colorado Springs, Mines at Victor, Colorado.

COLORADO SPRINGS, CO., May 19, 1898.

The Ingersoll-Sergeant Drill Co.—We bought two years ago one of the largest size and most fine type of Ingersoll-Sergeant Patent Inlet Compressor.

This was found to be too small for our needs about a year ago and we purchased of you a Duplex Corliss machine 10" x 18" x 42".

This was set in place in our shaft house in the Cripple Creek District, 10,000 feet above the level of the sea, and has been running continuously ever since, and at times over ten 3½" Kellipe drills. The steam cylinders were connected to an independent Jet Condenser, for which we are using the mine water, and the resultant economy of operation is very noticeable.

The operation of this Compressor is as near perfect as that of any machine we have ever seen, and this type is well worth the extra cost on account of the great permanent economy in operation.

Our mine is equipped exclusively with your drills and we have only the highest words of praise to give them. Yours very truly, The Portland Gold Mining Co., Jas. A. Burns, President.

IRON CLEI JACK POT 82 1/2% WHEEL OF FORTUNE 200 1/2% WORK 21%

## MEXICO

Name of Company	State	Price
Alianza	Hidalgo	5
Amistad y Concordia	"	24
Anguilas	Guanajuato	26
Arenales y Anexas	Hidalgo	120
Asturiana y Anexas	Zacatecas	170
Barradon y Cabras	Durango	160
Bartolome de Medina	Hidalgo	100
Cabecero y An	Zacatecas	100
Candelaria de Pinos	"	160
Campana	Durango	120
Cerro Gordo	Hidalgo	100
Castillanos y San Ramon	Guadalajara	25
Chico Colorado	Chiapas	10
Cinco Señores y An	Guanajuato	160
Concepcion y An	S. Luis Potosi	100
Ki Oro	Guanajuato	10
Raparana y An	Mexico	1,200
Guadalupe	Guanajuato	180
Huasteca	Santa Ana	100
Luz de Borda	Michoacan	100
Luis de Maravillas	Hidalgo	100
Pabellon	"	150
Paima	Zacatecas	100
Purisima de los Com	Hidalgo	5
Real del Monte	Hidalgo	900
Reyes	"	5
Restauradora	Durango	80
San Francisco	Hidalgo	270
S. Ped. Chichihuites	"	12
S. Rafael y Anexas	"	100
S. Rafael del Oro	Hidalgo	20
S. Luis de la Paz	S. Luis Potosi	850
Sirena	Durango	50
Soledad	Hidalgo	500
Sorpresas	"	250
Trinidad	Guanajuato	10
Tlauzingo	Puebla	27
Union	Hidalgo	280
Zomelahuacan (gold)	Vera Cruz	100
Zona Min de Pozos	Guanajuato	15

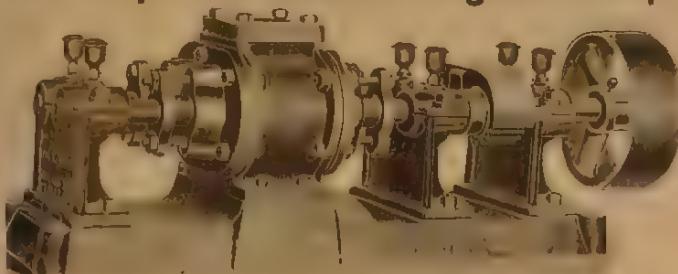
NOTE.—The above Mexican stocks are figured on the basis of Mexican silver

by mail, prepaid \$1.00

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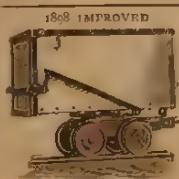
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NEWTON R. BELL, Agent.

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Arrive Barstow 3:15 p.m.  
Leave Barstow 3:35 p.m.  
Arrive Kramer, 5:05 p.m.  
Arrive St. Rino, 6:15 p.m.  
Arrive Johannesburg 8:50 p.m.

Returning Trains Leave  
Johannesburg 8:00 p.m.  
Arrive San Bernardino 5:35 a.m.  
Arrive Los Angeles, 8:30 a.m.

A through passenger coach is run between  
Barstow and Johannesburg.

Through tickets and particulars of any Santa  
Fe Route Agent

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days and Thursdays at 7 a.m.; returning arrives  
at Johannesburg on Tuesdays and Fridays at  
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Silver	.40	Gold, Silver and Lead	1.25
Gold & Silver	.75	Gold, Silver, & Copper	1.50
Lead	.50	Gold, silver, copper, lead	2.00

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about 1200 gallons of water in 24 hours - sufficient  
for working purposes. Has 800 feet development  
work consisting of shafts and drifts. Wood costs  
\$3.50 per cord, delivered; coke is to be had from  
El Paso, which is also the nearest smelting point  
— 50 miles distant. Formation is granite with  
porous rock and the drifts are easily driven to  
5½ feet wide. Pay streak to 6 inches at the  
surface with value of \$12.00, widening to 2 feet at  
bottom of 10 foot shaft having a value of \$350.00.  
One taken out concentrated \$450 to the ton while  
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thirds and the other one-third. The owner of  
the two-thirds is desirous of selling his controlling  
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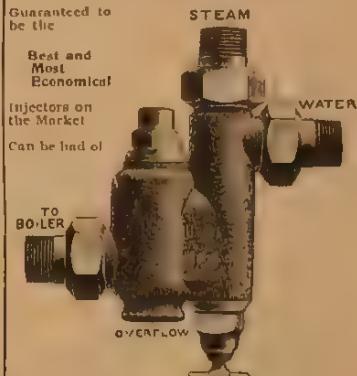
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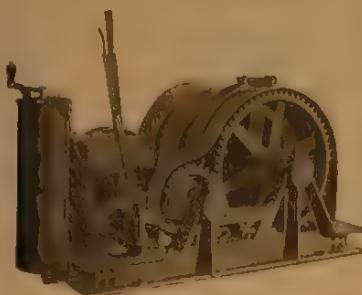
## INCORPORATED MINES PAYING DIVIDENDS.

NAMES OF MINES	LOCATION	No. of Shares	Capital Stock	Par Value	Amount of last Dividend	Date of Last Dividend	Total Amount Paid in Dividends	Kind of Metal Produced
1 Astna Cons.	California	100,000	\$ 500,000	\$ 5	\$ 10	Oct 1898	\$ 150,000	G
2 Alaska, Treadwell	Alaska	200,000	5,000,000	25	37½	July 1898	3,550,000	G
3 Alaska Mexican	Alaska	200,000	1,000,000	5	10	July 1898	299,021	G
4 Alice	Montana	400,000	10,000,000	25	05	April 1898	1,075,000	G, S, L
5 Anaconda	Montana	1,200,000	80,000,000	25	1 25	Nov 1898	8,230,000	G
6 Anchors Leland	Colorado	800,000	600,000	1	01	Nov 1898	108,000	G
7 American Gold	Colorado	800,000	3,000,000	10	09	Oct 1898	362,000	G, S, L
8 Associated	Colorado	1,250,000	1,250,000	1	01	Nov 1898	50,000	G
9 Atlantic	Michigan	40,000	1,000,000	25	1 00	Feb 1898	740,000	G
10 Aurora	Michigan	100,000	2,500,000	25	50	May 1898	750,000	I
11 Bald Batie	Montana	250,000	250,000	1	08	Oct 1898	627,118	G, C, S
12 Big Six	Colorado	500,000	500,000	1	00½	May 1898	15,000	G, S
13 Boston & Montana	Montana	150,000	3,750,000	25	5 00	Nov 1898	9,125,000	G, C, S
14 Breeches	Colorado	200,000	5,000,000	25	05	Dec 1898	30,000	I
15 Bullion Beck and Champion	Utah	100,000	1,000,000	10	10	Dec 1898	2,555,000	G, S
16 Bunker Hill and Sullivan	Idaho	300,000	3,000,000	10	07	Nov 1898	579,000	S, L
17 Cariboo	British Col.	800,000	800,000	1	02	Aug 1898	238,966	G
18 Calumet & Hecla	Michigan	10,000	2,500,000	25	10	Sept 1898	51,850,000	C
19 Centennial Eureka	Utah	30,000	1,500,000	50	50	Dec 1898	2,250,000	S, L
20 Central Lead	Missouri	10,000	1,000,000	100	50	Nov 1898	77,000	L
21 Champion	California	84,000	840,000	10	25	April 1898	298,200	G
22 Charleston	S. Carolina	10,000	1,000,000	100	1 50	Sept 1898	165,000	-
23 Chloride Point	Utah	500,000	500,000	1	01	Dec 1897	5,000	G, S
24 Colorado Smelting	Montana	100,000	1,000,000	10	50	July 1898	1,505,000	G, S, C
25 Crowned King	Arizona	600,000	6,000,000	10	02	Oct 1898	208,000	G, S, L
26 Deadwood Terra	S. Dakota	200,000	5,000,000	25	05	May 1898	1,360,000	G
27 De Lamar	Idaho	400,000	2,000,000	5	29	May 1898	2,451,600	S, L
28 Dutch	California	150,000	1,500,000	10	04½	Feb 1898	39,000	G
29 Elkton Consolidated	Colorado	1,250,000	1,250,000	1	01½	Oct 1898	636,961	G, S
30 El Paso	Colorado	650,000	650,000	1	01	Jan 1898	12,093	G, N
31 Empire State	Idaho	75,000	750,000	10	10	Nov 1898	35,000	-
32 Enterprise	Colorado	500,000	500,000	1	05	Sept 1898	900,000	S, L
33 Fern	British Col.	200,000	200,000	1	05	Jan 1898	110,000	-
34 Geyser-Marion	Utah	800,000	1,500,000	5	02	Sept 1898	98,000	G
35 Gold Coin of Victor	Colorado	1,000,000	1,000,000	1	01	Oct 1898	120,000	G
36 Golden Cycle	Colorado	200,000	1,000,000	5	02½	Oct 1898	155,000	-
37 Gold Com	Colorado	200,000	1,000,000	5	05	Nov .897	160,000	G, S
38 Golden Reward	S. Dakota	1,000,000	1,000,000	15	15	Feb 1898	165,000	G
39 Grand Central	Utah	250,000	250,000	1	12½	Dec 1898	218,750	G, S, C, L
40 Halls Mines Ltd.	British Col.	250,000	1,250,000	5	25	May 1898	180,000	-
41 Highland	S. Dakota	100,000	10,000,000	100	20	Nov 1898	3,761,713	G
42 Holy Terror	S. Dakota	300,000	300,000	1	03	Sept 1898	117,000	G
43 Homestake	S. Dakota	125,000	12,500,000	100	50	Nov 1898	7,118,750	G
44 Hope	Montana	100,000	1,000,000	10	10	Mar 1898	762,252	S
45 Horn Silver	Utah	400,000	10,000,000	25	05	Sept 1898	5,210,000	S, L
46 Idaho	British Col.	500,000	500,000	1	05	May 1898	264,000	-
47 Iowa	Colorado	1,000,000	1,000,000	1	00½	June 1898	90,000	G
48 Iron Mountain	Montana	500,000	5,000,000	10	02	Apr 1898	507,500	S
49 Isabella	Colorado	2,250,000	2,250,000	1	00½	June 1897	270,000	G
50 Kearsarge	Michigan	40,000	1,000,000	25	10	Aug 1897	180,000	C
51 Kennedy	California	100,000	10,000,000	100	48	Aug 1898	1,716,000	S, L
52 Le Roi	British Col.	500,000	2,500,000	5	10	Apr 1898	775,000	G
53 Little	Colorado	1,000,000	1,000,000	1	01	Oct 1898	146,110	G
54 Minnesota	Minnesota	165,000	16,500,000	100	1 50	Oct 1898	4,735,000	I
55 Modoc	Colorado	500,000	500,000	1	01	Dec 1898	110,000	G
56 Montana Ltd	Montana	680,000	3,300,000	5	05½	May 1898	2,997,557	G, S
57 Montana Ore Purchasing	Montana	40,000	1,000,000	25	1 00	Oct 1898	300,000	-
58 Morning Star	California	2,400	240,000	100	5 00	June 1898	668,600	G
59 Mt. Ross	Colorado	1,000,000	1,000,000	1	02	Jan 1898	80,000	G
60 Mercur	Utah	200,000	5,000,000	25	12½	Nov 1898	1,218,000	G
61 Mammoth	Utah	400,000	10,000,000	25	05	Oct 1898	1,330,000	G, S, C, L
62 Moon Anchor Gold	Colorado	600,000	600,000	1	07½	Nov 1898	261,000	G
63 Mountain Copper	California	250,000	6,250,000	25	62½	Sept 1898	93,750	C
64 New York & Hon. Rosario	Central A	150,000	1,500,000	10	10	Oct 1898	945,000	S, G
65 Napa	California	100,000	700,000	7	20	Oct 1898	950,000	Q
66 New Idria Quicksilver	California	100,000	500,000	5	20	Sept 1898	80,000	Q
67 North Star	California	200,000	2,000,000	10	25	Nov 1898	500,000	G
68 Ontario	Utah	150,000	15,000,000	100	75	Dec 1897	18,542,500	S, L
69 Osceola	Michigan	50,000	1,250,000	25	2 00	Dec 1898	2,552,500	C
70 Parrot	Montana	230,000	2,300,000	10	30	Oct 1898	2,000,808	C
71 Pennsylvania Consolidated	California	61,500	5,150,000	10	05	Oct 1898	48,500	-
72 Pioneer	California	100,000	1,000,000	10	12½	Dec 1898	60,000	G
73 Portland	Colorado	3,000,000	3,000,000	1	02	Nov 1898	2,250,080	G, S
74 Princess	Colorado	1,000,000	1,000,000	1	00½	Feb 1897	47,000	G
75 Quincy	Idaho	100,000	2,500,000	25	8 60	Aug 1898	10,120,000	C
76 Rambler-Cariboo	British Col.	1,000,000	1,000,000	1	02	April 1897	40,000	-
77 Raven	Colorado	1,500,000	1,500,000	1	01	March 1898	20,000	G
78 Reco	British Col.	1,000,000	1,000,000	1	10	Jan 1898	237,500	S, L
79 Republic	Washington	1,000,000	1,000,000	1	03	Dec 1898	90,000	G
80 Sacramento	Utah	1,000,000	5,000,000	5	00½	Nov 1898	67,000	G
81 Santa Rosalia	California	100,000	100,000	1	10	Feb 1898	125,000	G, S
82 Small Hopes Consolidated	Colorado	250,000	5,000,000	20	10	June 1898	3,300,000	S
83 South Swansea	Utah	150,000	150,000	1	05	Oct 1898	125,000	S, L
84 Standard	California	200,000	20,000,000	100	10	Aug 1898	5,074,940	G, S
85 St. Joseph	Missouri	30,000	3,000,000	10	1 50	Sept 1898	2,747,000	L
86 Silver King	Utah	150,000	8,000,000	.20	25	Dec 1898	1,800,000	S, L, G
87 Slocan Star	British Col.	2,000,000	1,000,000	0.50	05	Mar 1897	350,000	-
88 Smuggler	Colorado	1,000,000	1,000,000	1	01	Oct 1898	1,075,000	S, L, Z
89 Swansea	Utah	100,000	500,000	6	05	Dec 1898	136,500	S, L
90 Tamarack	Michigan	60,000	1,500,000	15	8 00	June 1898	5,331,000	C
91 Victor	Colorado	200,000	1,000,000	5	05	Oct 1898	1,155,000	G
92 Vindicator	Colorado	1,500,000	1,500,000	1	05	Oct 1898	180,500	G
93 Western Mine Enterprise	Montana	500,000	500,000	1	20	Jan 1898	48,680	-
94 War Eagle	British Col.	2,000,000	1,000,000	1	01½	Oct 1898	239,000	-
95 Wolverine	Michigan	60,000	2,500,000	25	1 00	Oct 1898	60,000	C
96 White Water	British Col.	125,000	1,625,000	5	32	April 1898	194,000	-
97 Yellow Aster	California	100,000	1,000,000	10	10	Oct 1898	148,789	G

S, Silver. G, Gold. L, Lead. O, Copper. Q, Quicksilver. I, Iron. Z, Zinc.

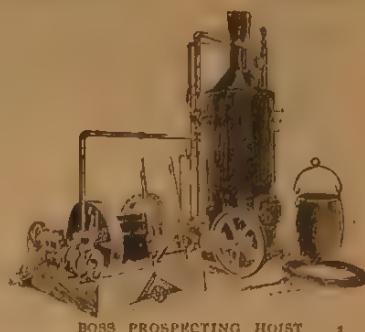
— Companies not listed have not paid a dividend for the last twelve months.

# HOISTING PLANTS



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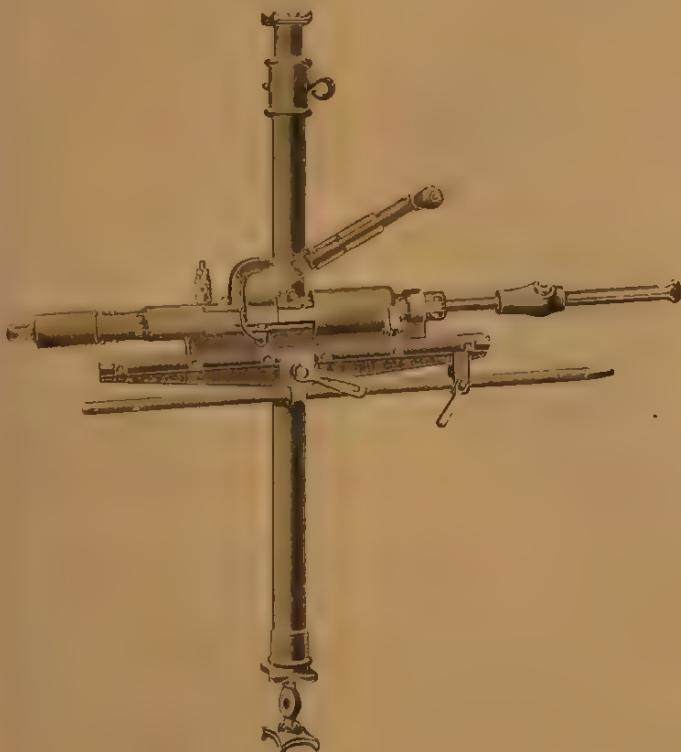
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A Machine built on Scientific principles  
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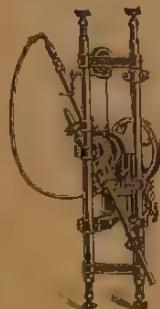
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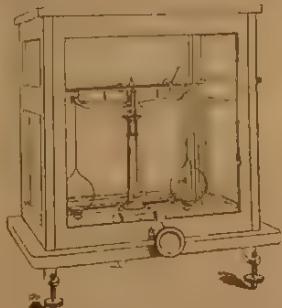
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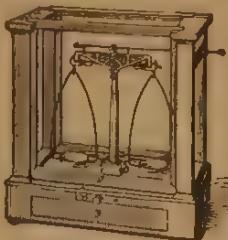
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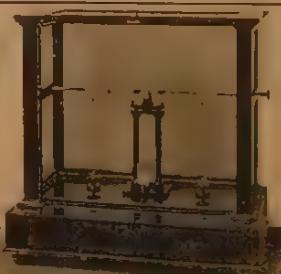
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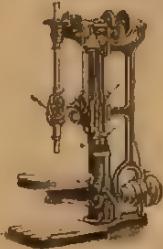
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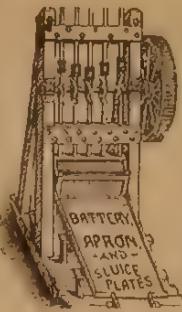
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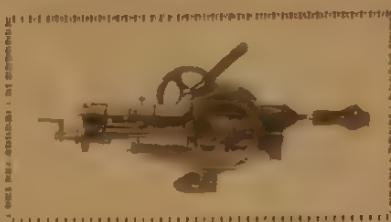
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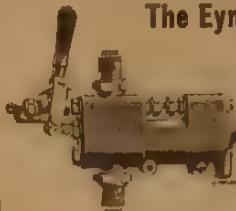
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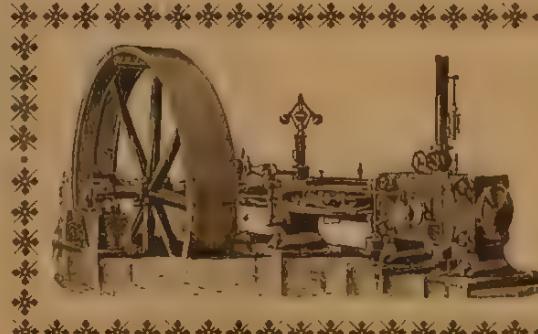
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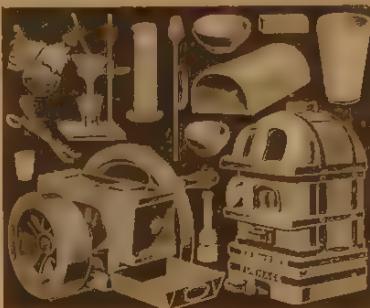
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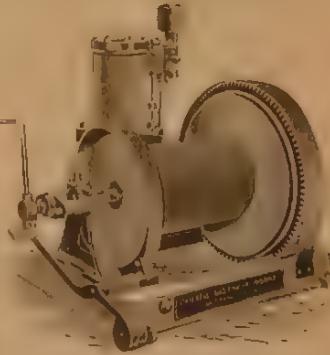
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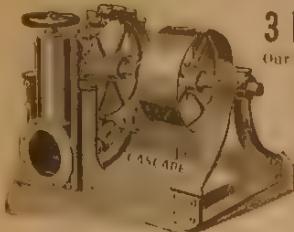
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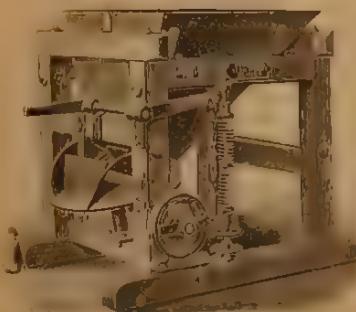
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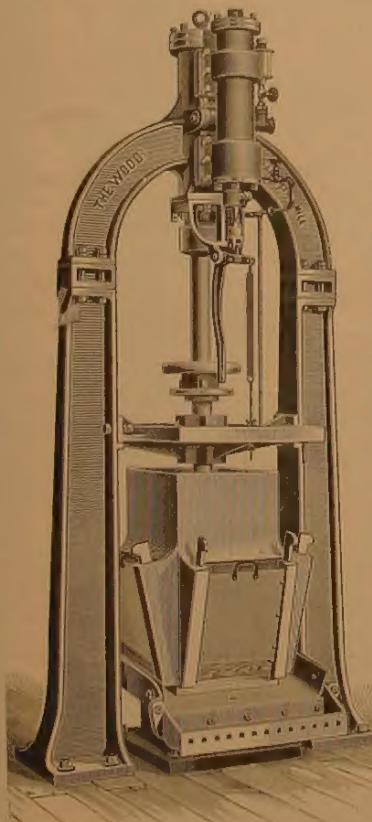
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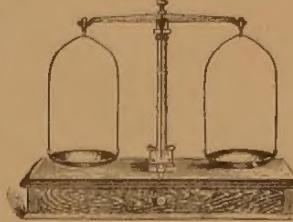
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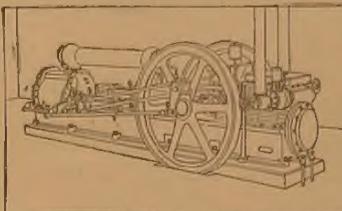
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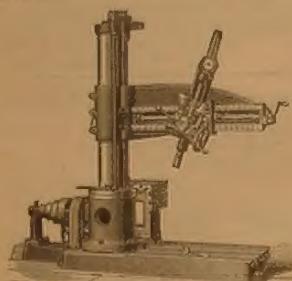
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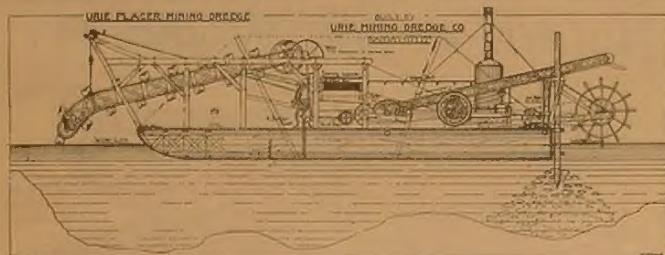
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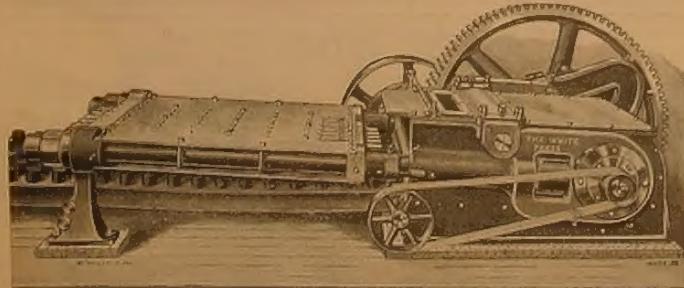
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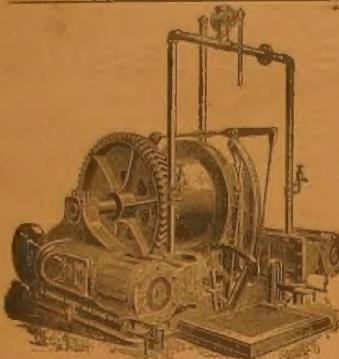
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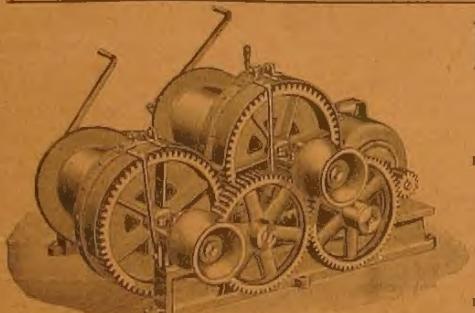
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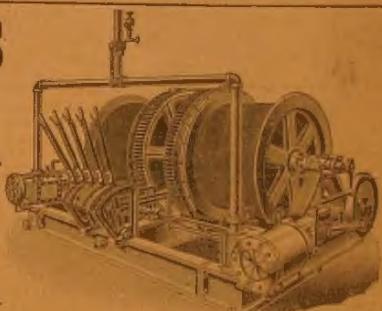
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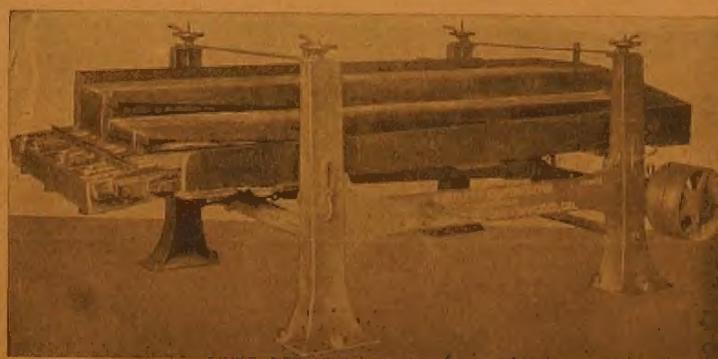
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